

Continental Heat Treating, Inc.
Environmental Documents
Index

1. Letter dated August 28, 2001 from United States Environmental Protection Agency to Continental Heat Treating.
2. Letter dated May 18, 2001 from Fero Engineering to Regional Water Quality Control Board.
3. Letter dated May 4, 2001 from Continental Heat Treating to Regional Water Quality Control Board.
4. Letter dated February 11, 1998 from Santa Fe Springs Fire Department to Department of Toxic Substances in regard to referral of site.
5. Letter dated February 11, 1998 from Santa Fe Springs Fire Department to Los Angeles Regional Water Quality Control Board in regard to referral of site.
6. Letter dated December 19, 1997 from Continental Heat Treating, Inc. to Santa Fe Springs Fire Department, Subject: Request for Workplan.
7. Letter dated December 7, 1997 from Trilogy Regulatory Services to Continental Heat Treating, Inc. and Chris A. Welsh, Subject: Review of Mobil Site Investigations.
8. Letter dated September 24, 1997 from Continental Heat Treating, Inc. to Santa Fe Springs Fire Department re: Letter dated September 12, 1997.
9. Letter dated September 12, 1997 from Los Angeles County Fire Department to Continental Heat Treating, Inc. re: Request for Clean Closure Letter.
10. July 1997 from Continental Heat Treating, Inc. to Department of Toxic Substances, submission of completed Nonemergency Hazardous Substance Release Report.
11. Letter dated June 18, 1997 from Department of Toxic Substances to Continental Heat Treating, Inc. requesting a Nonemergency Hazardous Substance Release Report.

12. Letter dated June 3, 1997 from Los Angeles County Fire Department to Regional Water Quality Control Board copying Continental Heat Treating, Inc., transmittal of files and site responsibility.
13. Letter dated May 27, 1997 from Los Angeles County Fire Department to Continental Heat Treating, Inc., a review of the Environmental Support Technologies Site Assessment Report.
14. Letter dated June 3, 1997 from County of Los Angeles Fire Department to Los Angeles Regional Water Quality Control Board.
15. Letter dated May 27, 1997 from County of Los Angeles Fire Department to Continental Heat Treating, Inc.
16. Environmental Support Technologies Site Assessment Report dated May 6, 1997.
17. Environmental Support Technologies Remedial Investigation Work Plan dated September 27, 1996.
18. Environmental Support Technologies Multi-Depth Soil Gas Survey Report dated May 8, 1996.
19. Environmental Support Technologies Work Plan to Perform a Multi-Depth Soil Gas Survey dated November 20, 1995.
20. Green Environmental, Inc. Site Investigation Report dated March 20, 1995.
21. Letter dated December 9, 1994 to Los Angeles County Fire Department from Mobil Exploration & Producing U.S. Inc. re Levine Fricke and McLaren/Hart Investigation Report.
22. McLaren/Hart Environmental Engineering Corporation Limited Subsurface Investigation Report dated November 15, 1994.
23. McLaren/Hart Environmental Engineering Soil Remedial Action Plan dated December 21, 1993.

Jerry 8-5 M-Th.

**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX****75 Hawthorne Street
San Francisco, CA 94105****August 28, 2001**

**Mr. James G. Stull, President
Continental Heat Treating
10643 South Norwalk Blvd.
Santa Fe Springs, CA 90670**

**RE: Continental Heat Treating
EPA ID#CAD053858296**

Dear Mr. Stull:

Enclosed is a Preliminary Assessment of the Continental Heat Treating site. This report contains the results of an evaluation conducted by the State of California Department of Toxic Substances Control for the U.S. Environmental Protection Agency (EPA) under Section 104 of the Comprehensive Environmental Response, Compensation and Liability Act of 1980, as amended [42 U.S.C. 9404], commonly known as Superfund. The purpose of the Preliminary Assessment is to determine whether this site may qualify for placement on the National Priorities List (NPL) or Superfund list. The enclosed fact sheet provides further explanation of the Superfund site assessment process.

Based on currently available information contained in the enclosed report, EPA has determined that further assessment is warranted. The enclosed Preliminary Assessment indicates that contamination at this site may warrant federal response, and that further assessment is needed. The next phase of the assessment process is a Site Inspection. The Site Inspection is a more extensive study and typically involves the collection of soil, water, air and/or waste sampling. EPA will contact you prior to any on-site inspection and sampling.

Please forward any written comments on the enclosed report to:

**Jerelean Johnson
U.S. Environmental Protection Agency
75 Hawthorne Street - SFD-5
San Francisco, CA 94105**

If you have any questions, please call Jerelean Johnson at 415/744-2345.

Sincerely,

Betsy Curnow

Betsy Curnow, Chief
States, Tribes & Assessment Office
Superfund Division

Enclosure

cc: Sara Amir, Department of Toxic Substances Control

*Discussed
with to duplicate
sufficient*

*8/17 w JJ - EPA does not
- copies of info would likely*

JS

Preliminary Assessment

Site Name: Continental Heat Treating
10643 South Norwalk Blvd.
Santa Fe Springs, California 90670

EPA ID#: CAD 053858296

Report Date: June 31, 2001

Submitted to: Rachel Loftin, USEPA Project Officer
State Project Officer
US EPA, Region IX, Superfund Program

Prepared by: Lori Parnass, Project Manager
California Environmental Protection Agency,
Department of Toxic Substances Control

Review & Concurrence: Rita Kamat, DTSC Unit Chief

1.0 INTRODUCTION

The U.S. Environmental Protection Agency (USEPA), Region IX, under the authority of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) and the Superfund Amendments and Reauthorization Act of 1986 (SARA), has tasked California Department of Toxic Substances Control (DTSC) to conduct a preliminary assessment (PA) of the Continental Heat Treating (CHT) in the City of Santa Fe Springs, County of Los Angeles, State of California.

The purpose of the PA is to review existing information on the Site and its environs to assess the threat(s), if any, posed to public health, welfare, or the environment and to determine if further investigation under CERCLA/SARA is warranted. The scope of the PA includes the review of information available from federal, state, and local agencies and performance of an on-site reconnaissance visit.

Using these sources of existing information, the Site is then evaluated using the EPA's Hazard Ranking System (HRS) criteria to assess the relative threat associated with actual or potential releases of hazardous substances at the Site. The HRS has been adopted by the EPA to help set priorities for further evaluation and eventual remedial action at hazardous waste sites. The HRS is the primary method of determining a site's eligibility for placement on the National Priorities List (NPL). The NPL identifies sites at which the EPA may conduct remedial response actions. This report summarises the findings of these preliminary investigative activities. This report summarises the findings of these preliminary investigative activities.

CHT was identified as a potential hazardous waste site and entered into the Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) on May 1, 1998 (CAD 053858296). (1)

1.1 Apparent Problem

The apparent problems at the site are as follows:

- CHT used solvents in a degreasing unit from 1986 to 1995. The unit was located in the center of CHT operations. Sampling results, adjacent to the degreaser, detected volatile organic compounds (VOCs) in soil and soil vapor from surface to sixty feet below ground surface (bgs) and approximately forty-eight feet in diameter. No vapor has been removed. (3, 9, 10, 11)
- VOC contamination has been detected along the northwest facility boundary, greater than 150 feet outside the CHT operations area. (9)
- The Mobil-Jalk/Fee property is located immediately adjacent to the north and northwest of CHT. VOC contamination in the soil has been detected in percentage concentrations. Groundwater samples detected tetrachloroethylene (PCE) as high as 2,200 $\mu\text{g/kg}$ and trichloroethylene (TCE) as high as 180 $\mu\text{g/kg}$ (the maximum contamination limit (MCL) for each of these substances is 5 $\mu\text{g/kg}$). (29)

- Groundwater is approximately 65' below ground surface (bgs) and regionally flows in a southerly direction. (6)

2.0 SITE DESCRIPTION

2.1 Location

CHT is located at 10643 Norwalk Boulevard, Santa Fe Springs, California. The geographic coordinates for the site are 33° 56' 09.0" North latitude and 118° 04' 28.0" West longitude (Township 3 South, Range 11 West, Section 6, San Bernardino Baseline and Meridian (SBM), USGS, Whittier Quadrangle, 7.5-minute Series, 1974). (7) The location of the site is shown in Figure 1.

2.2 Site Description

CHT occupies approximately 1.5 acres in an industrial area. It is located in the southwest portion of the Santa Fe Springs oil field, which is an active oil field, is bordered on the north by Mobil-Jalk/Fee, on the west and south by the Hathaway Properties and on the east by Norwalk Boulevard. (3)

CHT currently consists of a single building which houses the heat treating operations, plating line, and office. A hazardous materials storage area lies in the southwest corner of the property. (3) The layout for this site is shown in Figure 2 and sample locations are noted on Figure 3.

2.3 Operational History

Prior to 1969, site owners/operations are unknown. In 1969, Mr. Stall, Sr. and Tower Industries began operating as a heat treating facility. In 1986, Mr. Stall Jr. bought the business changed the name and ownership but maintained operating as a heat treating facility. CHT currently leases the property from the Northern Trust Bank and Mr. Benjamin Hathaway. Ana Hathaway Trust is the landowner. (3)

CHT processes metal parts with heat to perform carbon nitriding and nitriding on the surface of the metal. Current identified waste streams are waste quench oil, oil contaminated waste, sludge containing copper and spent alkaline cleaning solution. (27)

From 1986 to 1995, CHT housed a degreaser in the center of its operations. A soil boring to 10 feet bgs was drilled adjacent to the degreaser and was sampled at three depths (surface, five and ten feet). The surface soil sample detected tetrachloroethylene (PCE) and trichloroethylene (TCE) contamination at 7,514 and 4,759 micrograms per kilograms ($\mu\text{g}/\text{kg}$), respectively. The five-foot sample detected PCE at 290 and TCE at 21 $\mu\text{g}/\text{kg}$, respectively. The ten-foot sample detected PCE at 1855 and TCE at 66 $\mu\text{g}/\text{kg}$, respectively. (9)

A site-wide multi-depth soil gas survey was conducted in 1996. Sample results detected VOCs as high as 1,940 micrograms per liter ($\mu\text{g}/\text{l}$) to 35 feet below ground surface (bgs) proximal to the former degreasing operations. The highest concentration of VOCs (41 milligrams per liter

(mg/l)) was detected in the most northern portion of the property 15' bgs, along the northwest boundary. (10)

In 1997, a soil vapor extraction well was installed to 60' bgs in the former degreasing area. Soil samples were taken at five feet intervals. The samples detected PCE from 4.8 $\mu\text{g/kg}$ to a maximum of 130 $\mu\text{g/kg}$ and TCE from 3 $\mu\text{g/kg}$ to a maximum of 20 $\mu\text{g/kg}$. To date, no vapors have been extracted. (9)

The Mobil/Jalk-Fee, a facility immediately north and adjacent to CHT has detected PCE contamination on-site in concentrations as high as 27,000 parts per million (ppm) approximately 10' and 55,000 ppm approximately 55' north of CHT property line. In June 1988, approximately 2,600 tons of PCE and TCE contaminated soil was removed from the site. No confirmation samples were performed. Groundwater samples detected tetrachloroethylene (PCE) as high as 2,200 $\mu\text{g/kg}$ and trichloroethylene (TCE) as high as 180 $\mu\text{g/kg}$ (the maximum contamination limit (MCL)) for each of these substances is 5 $\mu\text{g/kg}$. (28)

2.4 Regulatory Involvement

2.4.1 U.S. Environmental Protection Agency (EPA).

CHT was identified as a potential hazardous waste site and entered into the Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) on May 1, 1998 (CAD 053858296). (1) CHT is listed in the Resource Conservation and Recovery Information System (RCRIS) January 12, 1997 database. The facility is a small quantity generator. (2)

2.4.2 California Environmental Protection Agency.

Department of Toxic Substances Control (DTSC).

DTSC was notified through a July 16, 1997, Non-Emergency Hazardous Substances release Report submitted of the on-site degreasing contamination. (23) DTSC conducted a site screening on March 20, 1998. It was approved April 9, 1999. An overall hazard factor of medium was assigned to the site. (30)

Regional Water Quality Control Board-Los Angeles (RWQCB-LA).

The RWQCB-LA has designated the groundwater in this area for potential use. The CHT neighbor Mobil-Jalk/Fee's remediation efforts are being handled under the oversight of the RWQCB. On March 1, 1999, RWQCB sent a letter to Alton Geoscience, stating that the soil at Mobil-Jalk-Fee had been remediated although they needed to continue with the groundwater monitoring and reporting program (29).

CHT owners have requested that they too be overseen by the RWQCB-LA. (8) Jimmy Woo is the contact. Continental Heat Treating is not yet working with the agency under a Consent Agreement or Order.

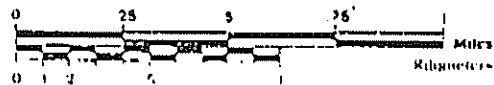
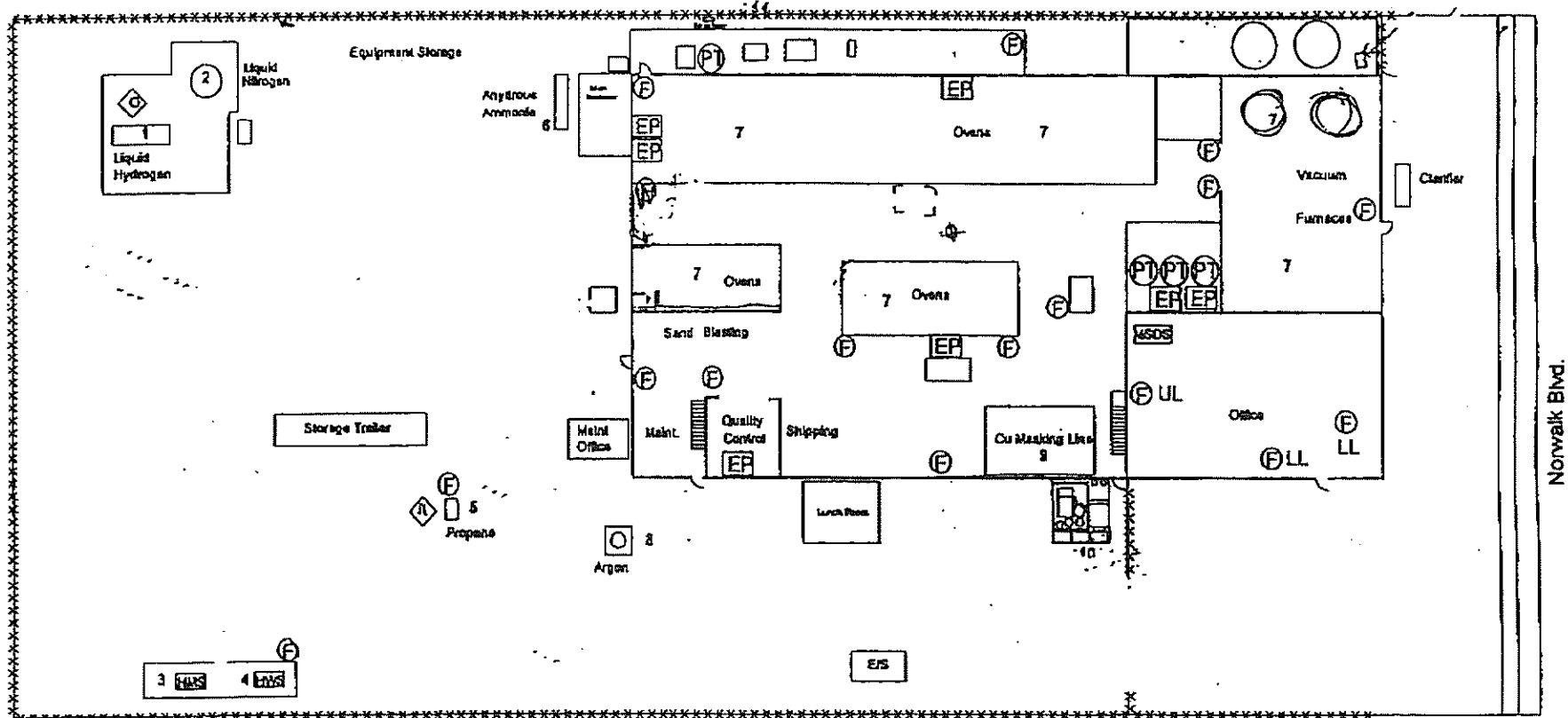


FIGURE 1
SITE LOCATION MAP
CONTINENTAL HEAT TREATING

Source of Map: Thomas Bros., L.A. County, 1992

Figure 2 Site Layout

-6-



- (F) = Fire Extinguisher
- (EP) = Electrical Panel
- (PT) = Pressure Tank

Continental Heat Treating, Inc.

10643 S. Norwalk Blvd.

Santa Fe Springs, CA 90670

50'
Scale

1 = Hydrogen Tank^a

2 = Nitrogen Tank

3 = Hazardous Materials Storage

4 = Hazardous Waste Storage

5 = Propane Tank

6 = Anhydrous Ammonia Tank

7 = Heat Treating Area

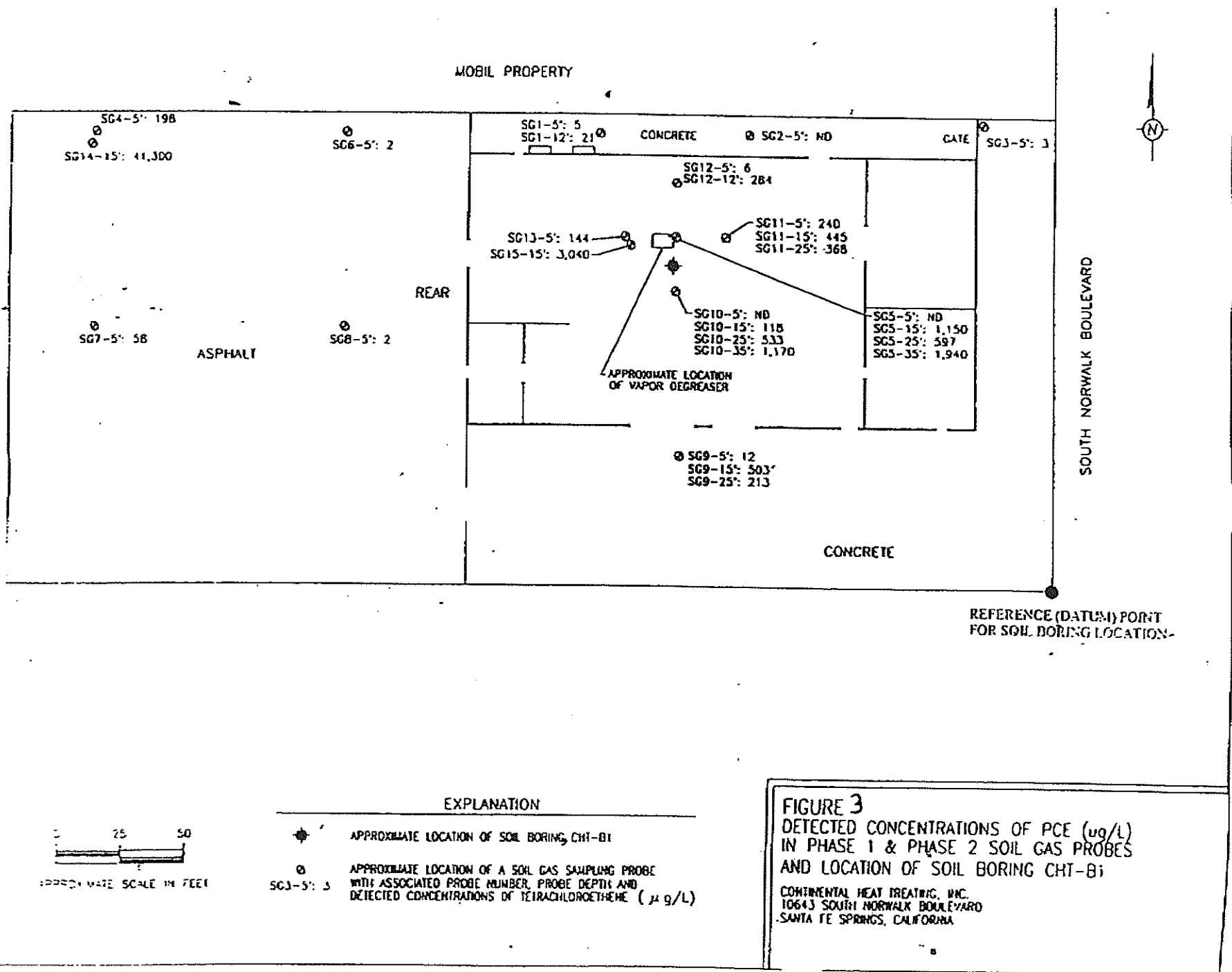
8 = Argon Tank

9 = Plating Line

10 = Chemical Storage

Figure 3 Site Boring Locations

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2.4.2 Local Agencies

Air Quality Management Districts, South Coast

CHT under permit number F19534 A/N 319375 operates an annealing furnace with 10 natural gas fired burners, each rated at 300,000 BTU per hour in accordance with Rule 206, Division 26 of the Health and Safety Code. (30)

County Sanitation Districts of Los Angeles County

CHT discharges an estimated 0.07 million gallons per year of industrial wastewater under permit number 4827. Discharge is from a parts washer and cooling tower blowdown. (32)

Santa Fe Springs Fire Department (SFSFD).

On July 1, 1997 SFSFD began providing regulatory oversight for this facility under the Certified Unified Program Agency. After a preliminary review of data regarding volatile organic compound contamination at CHT and the neighboring facility Mobil-Jalk/Fee, David R. Klunk, Director of Environmental Services for the City of Santa Fe Springs, referred both sites, to DTSC in a letter dated February 11, 1998. (24, 25, 26)

Los Angeles Fire Department, Health Hazardous Material Division (LACFD)

In a letter dated June 3, 1997 the LACFD referred the site to the RWQCB-LA. (5)

In 1997, a Phase 2 site assessment obtained additional deeper soil gas samples from CHT. The investigation was conducted with the LACFD oversight. The results characterized the lateral and vertical extent of VOC contamination the CHT site. A vapor extraction well was installed with probes at 50' and 60' bgs. Soil samples were taken at five feet intervals. The samples detected PCE from 4.8 $\mu\text{g/kg}$ to a maximum of 130 $\mu\text{g/kg}$ and TCE from 3 $\mu\text{g/kg}$ to a maximum of 20 $\mu\text{g/kg}$. To date, no vapors have been extracted. (9)

In 1996, LACFD required that a soil gas survey be performed. Thirteen 5-foot and two 15-foot probes were installed. VOC contamination was detected. Sample results detected VOCs as high as 1,940 micrograms per liter ($\mu\text{g/l}$) to 35 feet below ground surface (bgs) proximal to the former degreasing operations. The highest concentration of VOCs (41 milligrams per liter (mg/l)) was detected in the most northern portion of the property 15' bgs, along the northwest boundary. (10)

In 1995, LACFD requested a limited subsurface investigation be conducted beneath CHT due to the potential for PCE to exist in the subsurface soil. One hand auger boring was advanced to three depths where three discrete soil samples obtained. VOC contamination was detected. The surface soil sample detected tetrachloroethylene (PCE) and trichloroethylene (TCE) contamination at 7,514 and 4,759 micrograms per kilograms ($\mu\text{g/kg}$), respectively. The five-foot sample detected PCE at 290 and TCE at 21 $\mu\text{g/kg}$, respectively. The ten-foot sample detected PCE at 1855 and TCE at 66 $\mu\text{g/kg}$, respectively. (11)

3.0 HAZARD RANKING SYSTEM FACTORS

3.1 Sources Of Contamination

Potential hazardous substance sources associated with the site include:

- From 1986 to 1995, a degreasing unit operated in the center of CHTs operations. TCE and PCE have been detected in soil and soil vapor under and adjacent to the unit.

3.2 Groundwater Pathway

The first regional groundwater-bearing zone is the Exposition Aquifer, which is first encountered at approximately 60' bgs. The second regional aquifer is the Gage Aquifer, first encountered at approximately 110' bgs. The upper 100 feet of sediments consist predominantly of permeable sands, although the upper 15 feet of sediments have a higher silt and clay content and lower permeability. There are 50 drinking-water wells within a 4-mile radius of this site, which serve approximately 287,000 people.

3.2.1 Hydrogeological Setting.

The Santa Fe Springs Oil Field is located on the Santa Fe Springs plain, which is part of the Montebello Forebay non-pressure area of the Central Basin. Groundwater is found throughout the region under unconfined conditions in the Recent Alluvium and in the underlying Exposition Aquifer.

At the Mobil-Jalk/Fee property groundwater wells were sampled in which hazardous substance contamination was found. These wells are in the Exposition Aquifer. Although it is not known for sure at this time whether or not there is contamination in the Gage-Gardena Aquifer, which is a major source of drinking water, there is interconnection between the Exposition and both the Gage-Gardena and the Hollydale aquifers within 2 miles of the site. The Hollydale Aquifer is also a major source of drinking water for the Santa Fe Springs area.

Significant hydrologic features in the area include the San Gabriel River, which flows north to south; along the western edge of the city. There are also two extensive water spreading grounds/percolation basins approximately 1 to 2.5 miles northwest of the city limits. These features will act as groundwater recharge, or "mounding" areas, thus inducing groundwater flow away from them. (29)

3.2.2 Groundwater Targets.

The nearest drinking water well is Well Number 07. This well is operated by the City of Pico Rivera, and is located approximately one mile northeast of the site. (33)

The City of Santa Fe Springs operates a blended drinking water system that consists of 2 wells that serve approximately 38,950 people. Currently, the City of Santa Fe Springs obtains 50% of its drinking water from groundwater and 50% from surface water. No well contributes greater than 40 percent to the system. Both of the wells operated by the City of Santa Fe Springs are

within 4 miles of the site. (14)

The City of La Habra Heights operates a drinking water system that consists of 4 wells that serve approximately 6,300 people. Currently, the City of La Habra Heights obtains 100% of its drinking water from groundwater. No well contributes greater than 40 percent to the system. All 4 of the wells operated by the City of La Habra Heights are within 4 miles of the site. (19)

The Southern California Water Company operates a blended drinking water system that consists of 6 wells that serve approximately 45,000 people. Currently, the Southern California Water Company obtains 36% of its drinking water from groundwater and 64% from surface water. No well contributes greater than 40 percent to the system. All 6 of the wells operated by the Southern California Water Company are within 4 miles of the site. (12)

The City of Pico Rivera operates a drinking water system that consists of 8 wells that serve approximately 45,000 people. Currently, the City of Pico Rivera obtains 100% of its drinking water from groundwater. No well contributes greater than 40 percent to the system. All 8 of the wells operated by the City of Pico Rivera are within 4 miles of the site. (13)

Laurence McGee School operates a well that serves 538 people. Currently, Laurence McGee School obtains all of its drinking water from groundwater. This well operated by the Laurence McGee School is within 4 miles of the site. (18)

The City of Downey operates a drinking water system that consists of 21 wells that serve approximately 100,000 people. Currently, the City of Downey obtains all of its drinking water from groundwater. No well contributes greater than 40 percent to the system. Eighteen of the 21 wells operated by the City of Downey are within 4 miles of the site. (15)

The City of Norwalk operates a drinking water system that consists of 2 wells that serve 15,345 people. Currently, the City of Norwalk obtains 100% of its drinking water from groundwater. No well contributes greater than 40 percent to the system. Both of the wells operated by the City of Norwalk are within 4 miles of the site. (17)

The Park Water Company operates a blended drinking water system that consists of 4 wells that serve approximately 60,000 people. Currently, the Park Water Company obtains 20% of its drinking water from groundwater and 80% from surface water. No well contributes greater than 40 percent to the system. All 4 of the wells operated by the Park Water Company are within 4 miles of the site. (16)

The Pico Water District operates a drinking water system that consists of 7 wells that serve approximately 27,000 people. Currently, the Pico Water District obtains all of its drinking water from groundwater. No well contributes greater than 40 percent to the system. Two of the 7 wells operated by the Pico Water District are within 4 miles of the site. (22)

The San Gabriel Valley Water Company operates a blended drinking water system that consists of 4 wells that serve approximately 153,000 people. Currently, the San Gabriel Valley Water Company obtains all of its drinking water from groundwater. No well contributes greater than 40 percent to the system. Two of the wells operated by the San Gabriel Valley Water Company are within 4 miles of the site. (20)

The Bellflower/Somerset Mutual Water Company operates a blended drinking water system that consists of 16 wells that serve approximately 25,000 people. Currently, Bellflower/Somerset obtains 12% of its drinking water from groundwater and 78% from surface water. No well contributes greater than 40 percent to the system. One of the 16 wells is within 4 miles of the site (21).

3.2.3 Groundwater Pathway Conclusion.

A total of 3 wells have been sampled adjacent to CHT at the Mobil-Jalk/Fee facility. Sampling of these wells has shown that the Exposition Aquifer is contaminated with tetrachloroethylene (PCE) as high as 2,200 $\mu\text{g/kg}$ and trichloroethylene (TCE) as high as 180 $\mu\text{g/kg}$ (the maximum contamination limit (MCL) for each of these substances is 5 $\mu\text{g/kg}$). (29)

The soil in this area between ground surface and the Gage Aquifer consists predominantly of permeable sands without any known clay layer. Therefore, the potential for contamination of the deeper aquifer can be projected. Further, as has been previously stated, the Exposition Aquifer is interconnected with both the Gage and the Hollydale aquifers within 2 miles of the site.

Groundwater in the vicinity of CHT occurs in two aquifers. The first regional groundwater-bearing zone is the Exposition Aquifer, which is first encountered at approximately 60' below ground surface. The second regional aquifer is the Gage Aquifer, first encountered at approximately 110' bgs. Groundwater is found throughout this area under unconfined conditions in the Recent Alluvium and in the underlying Exposition Aquifer. Within the Santa Fe Springs Oil Field, the upper 100 feet of sediments consist predominantly of permeable sands, although the upper 15 feet of sediments have a higher silt and clay content and lower permeability. Therefore, there is the potential for contaminants to leach from the shallow Exposition Aquifer to the deeper Gage Aquifer.

The nearest drinking water well is approximately one-mile northeast of CHT. Eleven water purveyors operate 50 drinking-water wells within a 4-mile radius of this site. These wells are part of systems that serve approximately 287,000 people. This drinking water is partly from the Gage Aquifer, but mostly from the Hollydale Aquifer.

3.3 Surface Water Pathway

The surface runoff flows to the asphalted streets and into storm drains. These drains discharge into the local storm drain system which empty into the San Gabriel River (distance-2 miles) and then to the Pacific Ocean (distance-25 miles). There are no drinking water intakes, fisheries, or sensitive environments within 2 miles of the site.

3.4 Soil Exposure and Air Pathway

CHT is entirely fenced, secured, paved and/or covered with buildings. No residences, schools, or daycare centers are on the same property and within 200 feet of contamination associated with the site.

The weather is generally sunny and dry. The average temperature is 65 degrees Farenheit. The average annual rainfall is 23 inches. The prevailing wind speed is 5 miles per hour.

4.0 EMERGENCY RESPONSE CONSIDERATIONS

The National Contingency Plan [40 CFR 300.415 (b) (2)] authorizes the EPA to consider emergency response actions at those sites that pose an imminent threat to human health or the environment. For the following reasons, a referral to Region IX's Emergency Response Section does not appear to be necessary:

- No drinking water wells have been closed due to contamination directly linked to the site.

5.0 SUMMARY

Continental Heat Treating is located at 10643 South Norwalk Boulevard in the city of Santa Fe Springs, California, and consists of approximately 1.5 acres in an industrial area. The site currently consists of a single building which houses the heat treating operations, plating line, and office. A hazardous materials storage area lies in the southwest corner of the property.

The site has processed metal parts with heating units since 1969. From 1986 to 1995, CHT housed a degreaser in the center of its operations. In 1995, a soil boring to 10 feet bgs was drilled adjacent to the degreaser and was sampled at three depths (surface, five and ten feet). Volatile organic compound contamination was detected in the soils and soil vapor underneath and adjacent to the degreasing unit. No vapor has been removed.

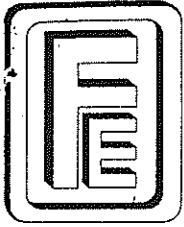
Current identified waste streams are waste quench oil, oil contaminated waste, sludge containing copper and spent alkaline cleaning solution. Continental Heat Treating handles their hazardous waste under the Hazardous Waste Control Law, CA H&SC Division 20, Chapter 6.5 and is inspected by a local enforcement agency. The City of Santa Fe Springs referred this site to DTSC and RWQCB. The site has requested the Regional Water Quality Control Board oversee VOC contamination remediation activities. The Regional Water Quality Control Board has confirmed that Mobil-Jalk/Fee has remediated the contaminated soil sources at the neighboring facility but continues to be actively overseeing the groundwater monitoring.

CHT is entirely fenced, secured, paved and/or covered with buildings. No residences, schools, or daycare centers are on the same property and within 200 feet of contamination associated with the site.

The pertinent HRS factors associated with the Site are:

- TCE and PCE has been detected in soil and soil vapor under the site. A soil vapor extraction well was installed but, to date, no vapors have been extracted. The same contaminants have been detected in soil and groundwater in the adjacent property, Mobil-Jalk/Fee.
- Approximately 250,000 people are using drinking water from wells located within 4 miles of this Site.

- There are no drinking water intakes, fisheries, or sensitive environments within 2 miles of the site.
- The site is fenced and its surface is completely covered with either pavement or buildings.
- No residences, schools, or daycare centers are on the same property and within 200 feet of contamination associated with the site.



FERO ENGINEERING

ENVIRONMENTAL ENGINEERING & CONSULTING

May 18, 2001

Mr. Eric Wu
Regional Water Quality Control Board
Los Angeles Region
320 West 4th Street, Suite 200
Los Angeles, California 90013

Via Telecopier

Dear Mr. Wu:

Unsaturated Soil Remediation System Installation Workplan
Continental Heat Treating, Inc.
10643 South Norwalk Blvd., Santa Fe Springs, California

Fero Environmental Engineering, Inc. (Fero) submits this soil remediation system installation workplan for the referenced site on behalf of the subject site owner, Continental Heat Treating, Inc. Fero proposes to remediate the area around the former vapor degreaser using a Vapor Extraction System (VES), the design of which is based on a review of Environmental Support Technologies, Inc. (EST), *Site Assessment Report, Continental Heat Treating* (Report), dated May 6, 1997. A copy of that report is attached.

I. BACKGROUND

The Report describes previous investigations conducted at the site by EST and it provides near surface soil sampling data collected by Green Environmental. EST and Green identified chlorinated hydrocarbons consisting primarily of Tetrachloroethylene (PCE) and Trichloroethylene (TCE) from grade to just above the water table proximate to a former degreaser location. The PCE and TCE were detected at maximum soil gas concentrations of 1,948 ug/L and 156 ug/L, respectively near the northeast corner of the former degreaser and their concentrations generally decreased with increased radial distance away from that location. EST collected soil gas samples at 15 locations across the site at up to four depths at each location to a maximum depth of 35 feet. Based on the soil gas results, a boring was conducted to groundwater approximately five feet to the south of the former degreaser. Groundwater was encountered at approximately 68 feet below grade (fbg). PCE was detected in all

of the soil samples collected from 5 to 60 fbg at concentrations ranging from 4.8 to 130 ug/Kg. The soil gas sampling points and soil boring locations are indicated on Figure 1. Fero believes that a sufficient number of soil gas samples and soil matrix samples have been collected at the site to determine the vertical and lateral extent of the organics for remediation purposes.

II. VES REMEDIATION SYSTEM DESIGN

Due to the vertical extent of the organics in the soils at the site and to a lesser extent to the volatility of those organics, vapor extraction appears to be the most efficient means of removal. A boring log provided in the EST Report indicates the site lithology consists primarily of silt and clay mixtures with minor amounts of sand. This may limit the effectiveness of vapor extraction. During their site investigation, EST installed a vapor well to approximately 45 fbg in their soil boring. Fero proposes to conduct a vapor extraction test using that well and to monitor the test with existing probes. If none of the probes installed previously are available, Fero will install up to four multi depth probes (5', 15', 30', 45' and 60'- if achievable) to conduct the test and to monitor future extraction activities.

Following the test, Fero proposes to conduct remediation at the subject site using a vapor extraction system (VES) with a single deep extraction well, which will likely be screened from 10 to 65 fbg. The total well depth is based on a depth to groundwater of 68 feet determined during the most recent assessment. The lithology and subsequently, the design of the extraction system will be confirmed in the field based on soil profile logging which will be conducted during the well installation. Additional details regarding VES wells, probes, system installation, and progress monitoring are presented below.

A. Probe and VES Well Installations

The ultimate means by which to monitor the progress of the proposed soil remediation shall be through periodic sampling and analysis of vapor samples from subsurface vapor monitoring probes. Soil vapor VOC concentration measurements allow detection of VOCs from all soil profiles of concern primarily due to diffusion of the volatile compounds. Therefore, soil gas measurements are not as susceptible to precise placement requirements imposed on soil sampling and therefore, it offers an improved consistency for site monitoring. Fero will use soil vapor measurements to monitor the progress of the VES.

A vertical and lateral evaluation of VOCs in the vadose zone beneath the project site has been conducted as indicated in the EST Report. Fero contoured the PCE data collected by EST at 5 & 15 fbg and superimposed the contours onto copies of a plot plan generated by Trilogy Regulatory Services. The resulting iso-concentration plots are presented herein as Figures 2 & 3. The plots were used to select optimum locations for probe installations to monitor the extraction system. Fero will rely on a minimum of four monitoring probe installations, likely at 5', 15', 30', 45' and 60' for the initial system testing. These may be a combination of

functional probes remaining from the EST testing and those installed by Fero. Any new probes will consist of small diameter (1/4" diameter) polyethylene tubing to be installed to the appropriate depth by Hydro-Geo Spectrum (HGS) using either a Geoprobe or hand operated rotary hammer. Vacuums at the probes will be monitored using Magnahelic Gauges and gas concentrations will be measured by HGS in a gas chromatograph mass spectrophotometer (GCMS). The tentative probe locations are indicated on Figure 4.

The initial test will be used to size the blower to be used for vapor extraction, to determine the number and locations of any additional well installations required to accomplish the desired level of soils remediation beneath the site and the number and locations of any additional monitoring probes required to monitor remediation progress. The need for any additional well installations will be determined based on vacuum readings in onsite probes and zone of influence calculations made during system testing.

During installation of the vapor extraction wells, lithology will be logged every 2.5 feet using an 18" standard pin drive sampler. A CME 75 mobile drill rig (or equivalent) equipped with 10" diameter continuous flight augers will be used to conduct the vapor well boring however, the well may be installed using a limited access rig due to access restrictions inside the onsite building.

The VES well will be constructed of 4-inch diameter schedule 40 PVC pipe. The well shall be slotted with 0.020" screen from 10 to 65 fbg. No. 3 sand shall be used as well screen packing from the boring terminus to approximately 8 fbg. The well will be sealed with hydrated Bentonite chips from 8 fbg to 1 fbg. The VES well shall be completed at grade using a 12 inch diameter traffic rated monitoring vault with sealed bolted lid which has been concreted in place.

Subsurface header piping shall extend from the VES wellhead to the extraction equipment to be installed along the wall located on the northern property line. The system flow will be channeled through a moisture knockout vessel, into a single regenerative blower, through three granular activated charcoal (GAC) drums installed in series, then to the atmosphere through an exhaust stack which runs up above the building roof line.

B. System Start-Up and Monitoring

Fero will prepare and submit a permit application and obtain a permit from SCAQMD for operation of the proposed vapor extraction system. A vapor treatment system diagram is included herein as Figure 5.

Once initial VOC vapor concentrations are obtained from the onsite probes designated for system monitoring and a permit is obtained from the SCAQMD, Fero will connect the system to a regenerative blower (size to be determined by system test however, likely 3.0 Hp) and will initiate extraction. A Magnahelic vacuum gauge will be used to record the resulting vacuums at the wellhead and at the well probes. The applicable manufacturer published flow vs. vacuum curve shall be used to determine extracted airflow at the achieved vacuum.

The concentration of organics at the blower discharge shall be measured on a daily basis for the first two weeks and then on an approximate weekly basis (consistent with SCAQMD permit requirements) for the operating life of the system to monitor remediation progress. Additionally, the onsite probes designated for system monitoring will be sampled and the samples analyzed via GCMS on a semi-annual basis following a minimum 10-day shut down period. Routine wellhead VOC concentrations shall be measured using a photoionization detector (PID). Semi-annual analytical testing will be performed by HGS.

Once probe and wellhead concentration readings suggest remediation is complete, an approved soil vapor lab will be utilized to obtain final soil vapor VOC concentrations from the onsite probes designated for system monitoring. Consistent with current RWQCB requirements, a rebound test will be conducted upon completion of the remediation activities to verify that remediation is complete. The rebound test involves shutting the VES system off for at least one month prior to collecting final soil vapor samples using the mobile soil vapor lab.

III. PROPOSED REMEDIATION END POINT

The most recent California Regional Water Quality Control Board (RWQCB)- Los Angeles Region *Interim Site Assessment and Cleanup Guidebook, Volume 1: Assessment and Cleanup Guidance, Table 5-1; Average Attenuation Factor For Different Distances Above Ground Water And Lithology*, dated May 1996 indicates that, based on a depth to groundwater of 68 feet and soil types generally of silt and clay mixtures to 65 fbg, the maximum allowable concentration (soil screening level) of both PCE and TCE (same Maximum Contaminant Levels of 5 ug/L) is **200 ug/Kg** at 5 feet below grade, is **77.5 ug/Kg** at 25 feet below grade, is **40 ug/Kg** at 45 feet below grade, is **20 ug/Kg** at 55 feet below grade. Therefore, using the observed maximum soil concentrations in the soil matrix, PCE is above the acceptable maximum concentrations allowed at the site at 0.5 and 60 feet below grade. The soil gas data suggest the organics concentrations at 15, 25 & 35 fbg exceed allowable levels although the soil gas data cannot be used in the formulae directly.

As the proposed vapor extraction system operates, the decreasing concentrations of PCE and other VOCs in the soils will be reflected by a proportional decrease in adjacent soil pore space vapor concentrations in reasonable accordance with Henry's Law (i.e., assumes the release of PCE from the soil profile is rate limited by its release from the soil moisture). It is Fero's experience that soil gas concentrations measured in ug/L are typically higher than soil matrix concentrations measured in ug/Kg in most soils. Therefore, it follows that, at such time as the soil gas concentrations (in ug/L) drop below the appropriate target concentration (in ug/Kg), a rebound test for closure will be conducted. The area around the former degreaser will be considered remediated once soil matrix PCE concentrations decrease to below the soil-screening levels or until a reasonable asymptotic relationship is reached between the remaining VOC concentrations and 0 concentration (curve baseline).

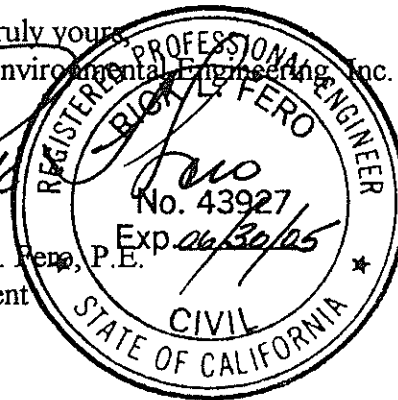
Fero will commence with installation of the monitoring probes and the system test upon review and approval of this document by your office. Upon completion of the test, a permanent vapor extraction well will be installed for remediation and the well will be connected to the collection and treatment system. Fero will prepare and submit a permit application and obtain a permit from SCAQMD for continuous operation of the proposed vapor extraction system.

Upon completion of system installation and testing, Fero will prepare and submit a letter report which details field activities, which provides analytical data and any extraction test results, and which contains an evaluation of the collected data, associated figures, and conclusions/recommendations regarding remediation system effectiveness, and any proposed system alterations.

Should you have any questions pertaining to this soil remediation work plan, please do not hesitate to contact me at (714) 256-2737.

Very truly yours,
Fero Environmental Engineering, Inc.

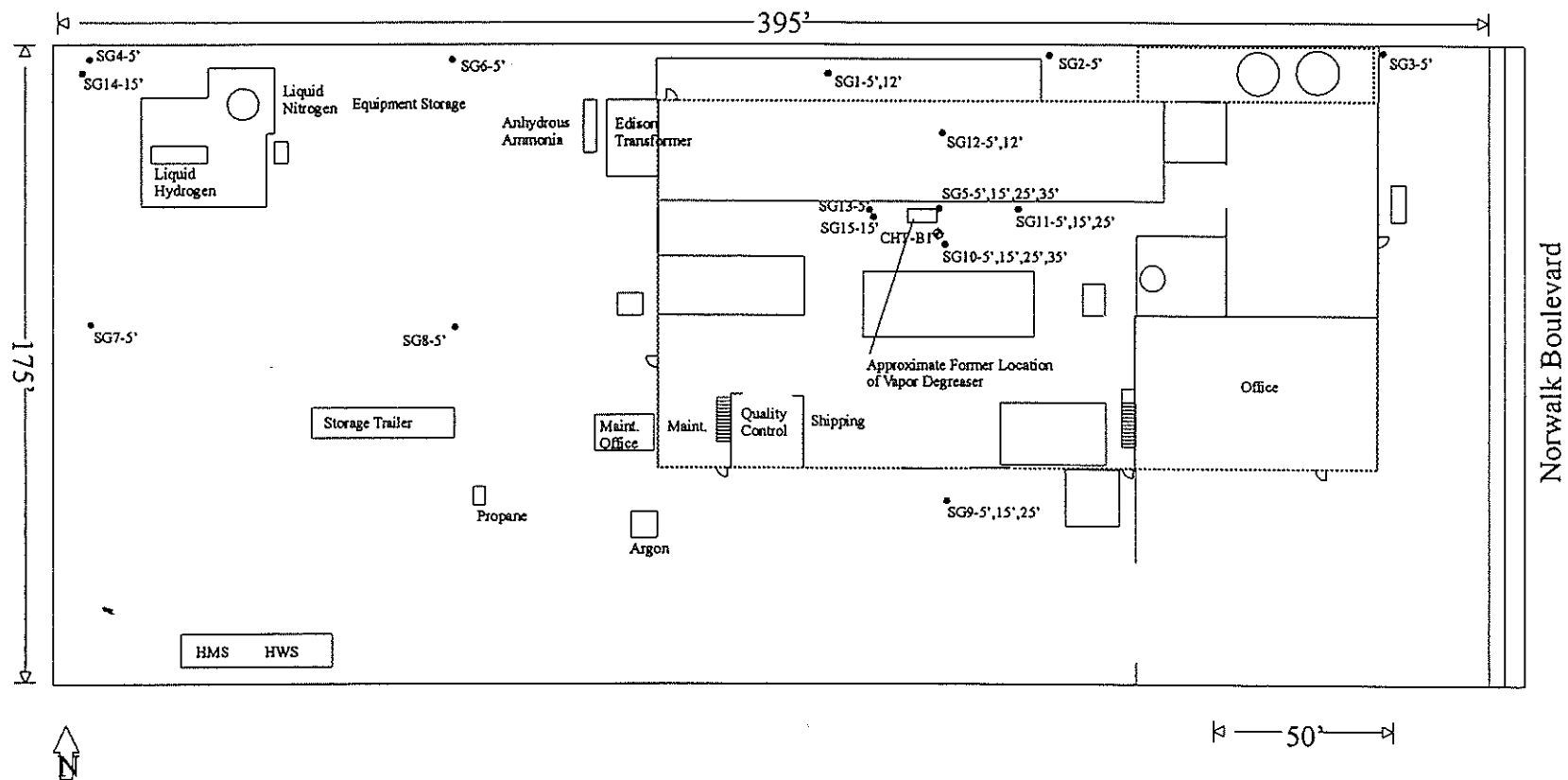

Rick L. Fero, P.E.
President



RLF:jbp
[381VESwpl]

cc: Jim Stull
Continental Heat Treating

Robert W. Schneider
Trilogy



Legend

- ◆ - Soil Boring Location
- - Soil Gas Sampling Location

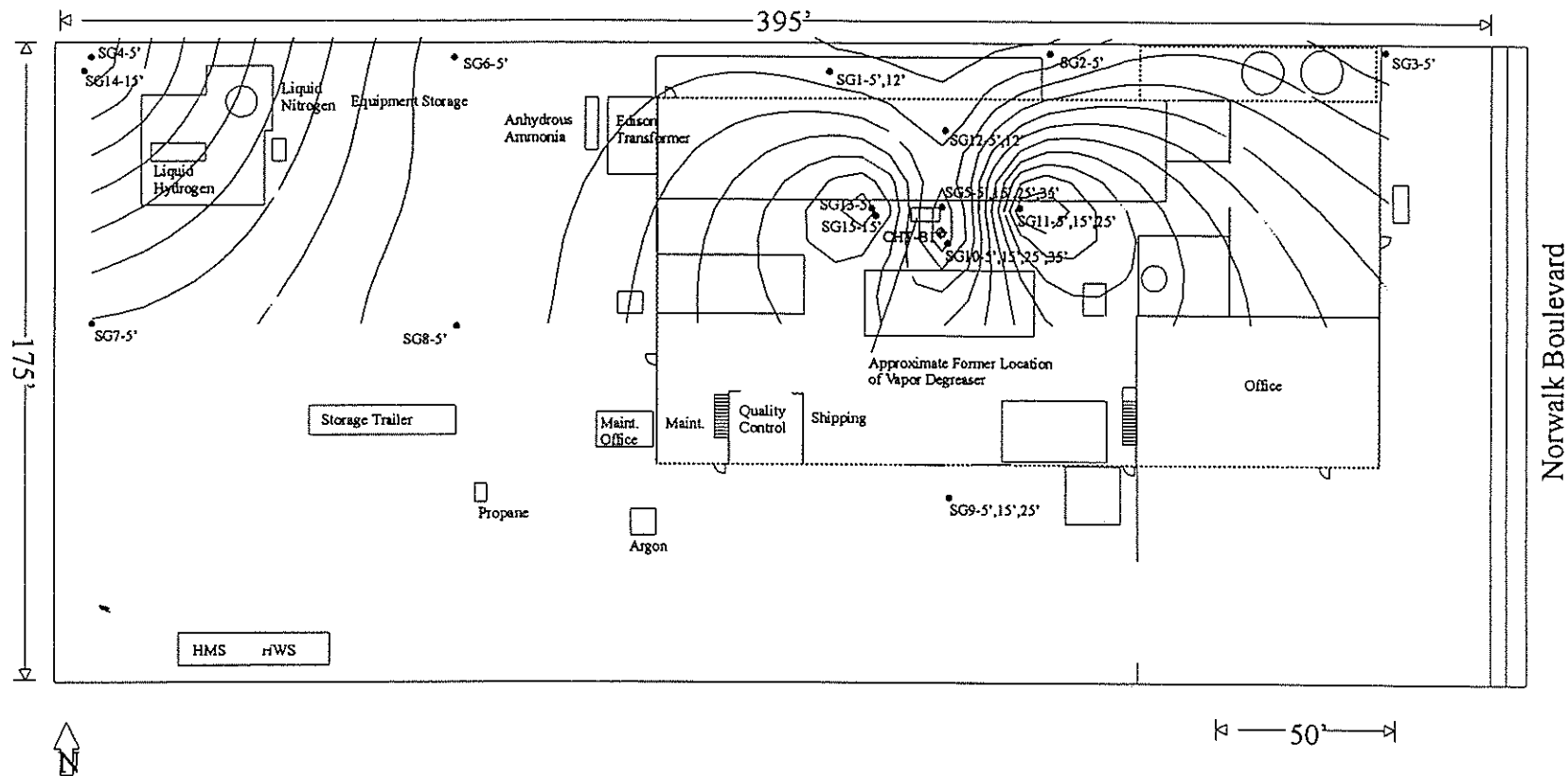


FERO ENGINEERING
ENVIRONMENTAL ENGINEERING & CONSULTING

Continental Heat Treating, Inc.

10643 South Norwalk Boulevard
Santa Fe Springs, California

Base Map Source: Trilogy Regulatory Services



Legend

- ◆ - Soil Boring Location
- - Soil Gas Sampling Location

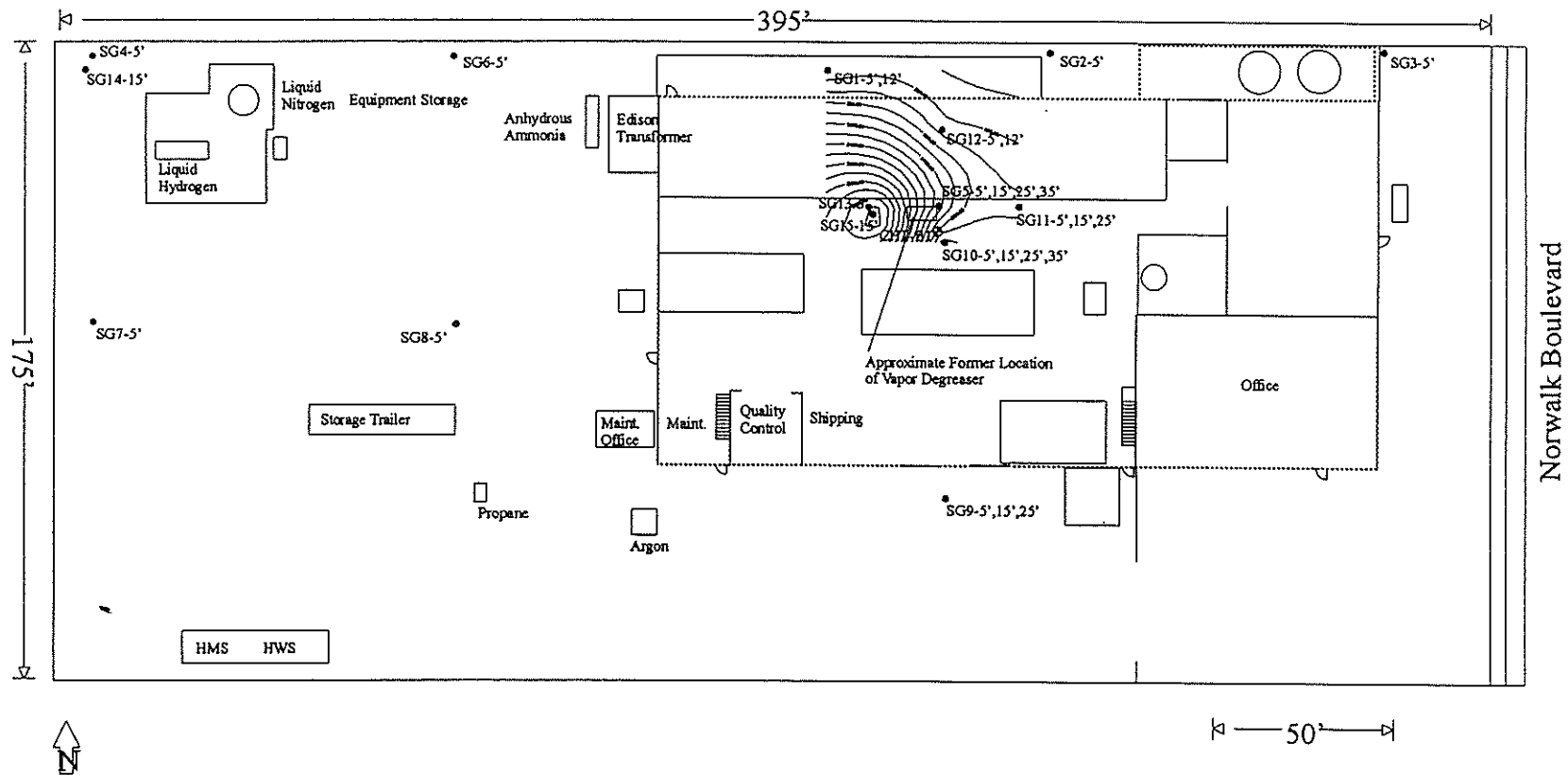


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PCE Concentrations 5'
1997 EST Data
Continental Heat Treating, Inc.

10643 South Norwalk Boulevard
Santa Fe Springs, California

Base Map Source: Trilogy Regulatory Services



Legend

- ◆ - Soil Boring Location
- - Soil Gas Sampling Location

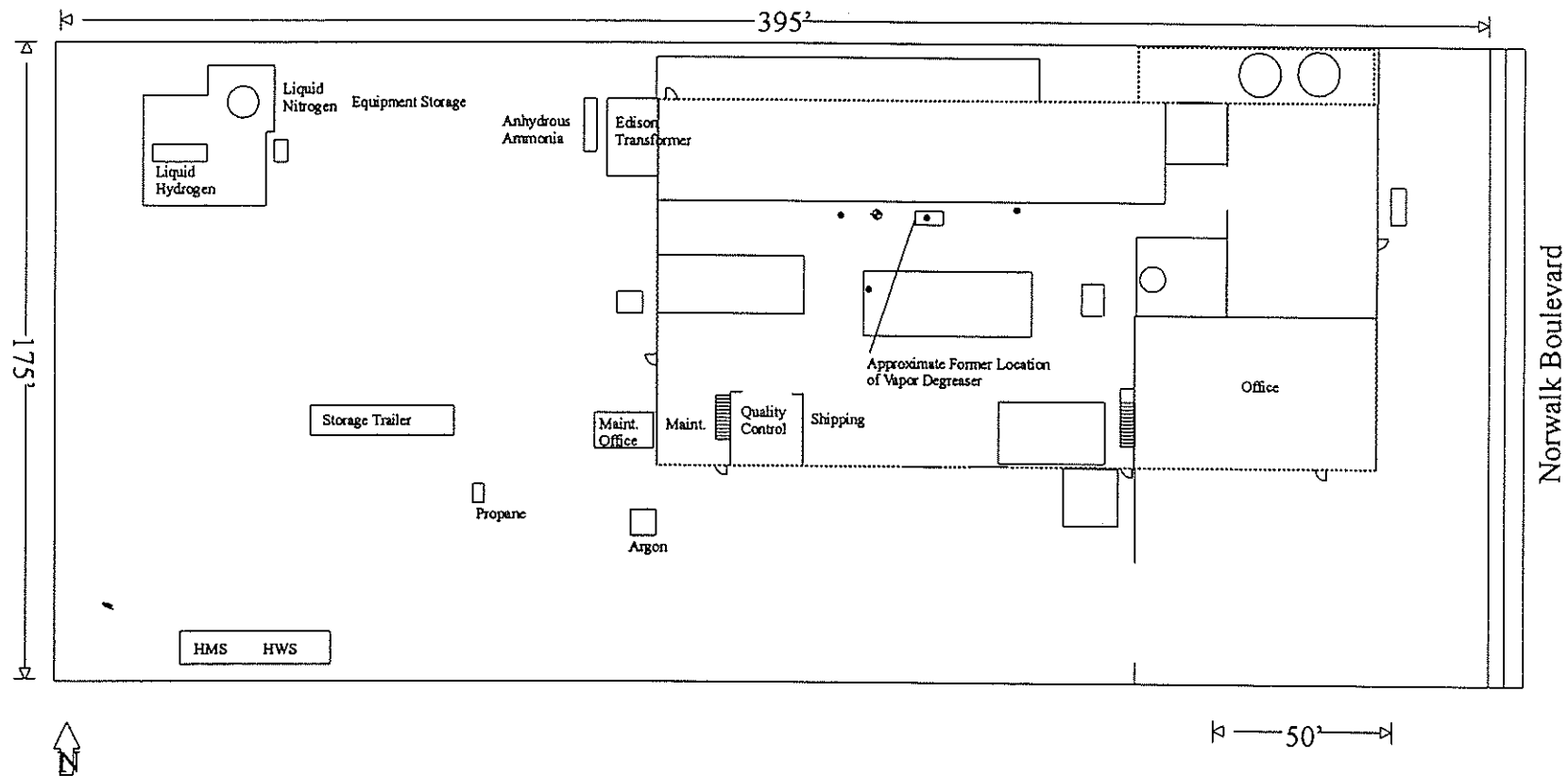


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PCE Concentrations 15'
Continental Heat Treating, Inc.

10643 South Norwalk Boulevard
Santa Fe Springs, California

Base Map Source: Trilogy Regulatory Services



Legend

- ◆ - Proposed Soil Gas Extraction Location
- - Proposed Soil Gas Sampling Location

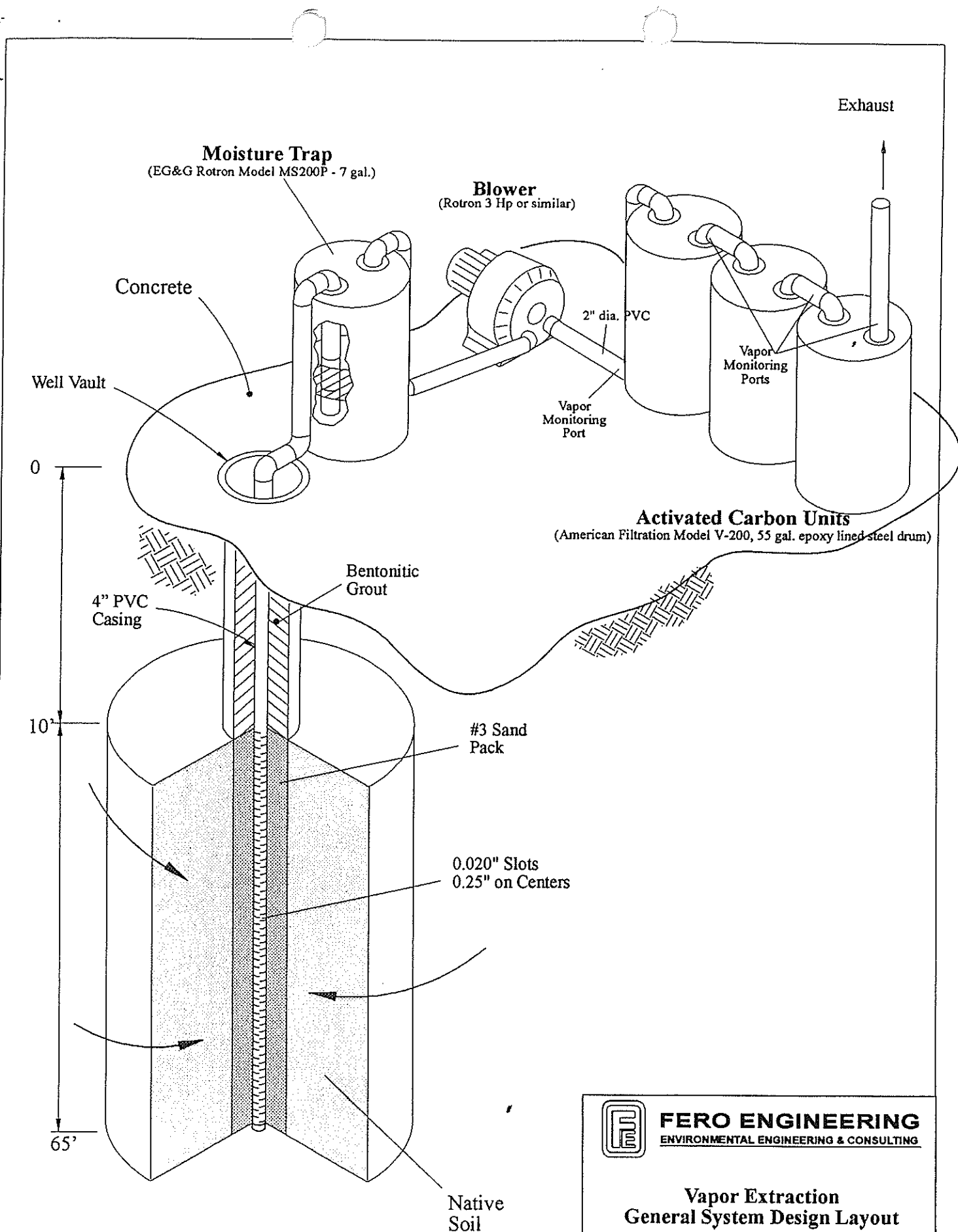


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**Proposed Well and
Probe Locations
Continental Heat Treating, Inc.**

10643 South Norwalk Boulevard
Santa Fe Springs, California

Base Map Source: Trilogy Regulatory Services



N.T.S.

[381VESdia3carb]



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Vapor Extraction General System Design Layout

Continental Heat Treating, Inc.
10643 S. Norwalk Blvd., Santa Fe Springs

Figure 5



SITE ASSESSMENT REPORT

**CONTINENTAL HEAT TREATING
10643 SOUTH NORWALK BOULEVARD
SANTA FE SPRINGS, CALIFORNIA**

Prepared for:

**Continental Heat Treating
10643 South Norwalk Boulevard
Santa Fe Springs, California 90221**

Prepared by:

**ENVIRONMENTAL SUPPORT TECHNOLOGIES, INC.
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Project No. EST1315

May 6, 1997

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- B. USCS Criteria
- C. Sieve Analyses Results for Soil Samples
- D. Soil Boring Log
- E. Laboratory Analyses Reports and Chain-of-Custody Form for Soil Samples

SITE ASSESSMENT REPORT

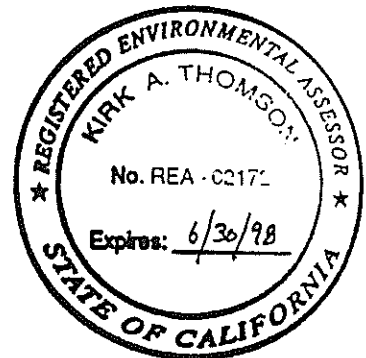
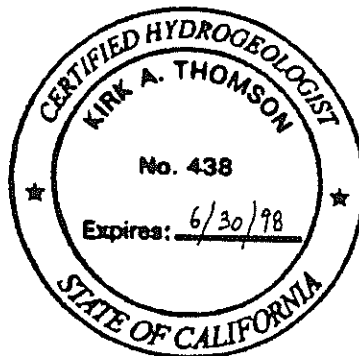
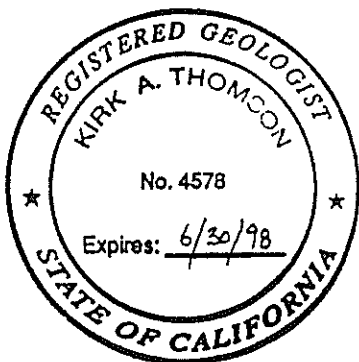
Continental Heat Treating
10643 South Norwalk Boulevard
Santa Fe Springs, California

WARRANTIES AND LIMITATIONS

This Site Assessment Report was prepared by Environmental Support Technologies, Inc. (EST) for the exclusive use of Continental Heat Treating and assigned interested parties. The services described within this document were performed in accordance with generally accepted professional consulting principles and practices. No other warranty, expressed or implied, is made.

The information contained in this report was based on measurements performed in specific areas during a specific time period. EST's professional opinions and conclusions are based in part on interpretation of data from discrete sampling or measurement locations that may not represent actual conditions at unsampled or unmeasured locations.

EST assumes no responsibility for issues arising from changes in environmental standards, practices, or regulations subsequent to performance of site assessment work. In the event that any changes occur in waste management practices, site conditions, or uses of the property, the conclusions and recommendations contained in this document should be reviewed and modified or verified in writing by EST. EST does not warrant the accuracy of information supplied by others, nor the use of segregated portions of this document.



Kirk A. Thomson

Kirk Thomson, R.G., C.H.G., R.E.A., M.S.
Project Manager/Principal Hydrogeologist

Michael E. Tye

Michael E. Tye
Project Hydrogeologist

May 6, 1997

EXECUTIVE SUMMARY

On March 10, 14, and 27, 1997, Environmental Support Technologies, Inc. (EST) performed site assessment work at the Continental Heat Treating (CHT) facility located at 10643 South Norwalk Boulevard in Santa Fe Springs, California. Recent site assessment work was performed to address requirements set forth by the Los Angeles County Fire Department (LACFD) in a letter to CHT dated August 6, 1996. The site investigation was performed in accordance with the LACFD-approved "Remedial Investigation Work Plan" (EST, September 26, 1996), "Remedial Investigation Work Plan Addendum" (EST, October 8, 1996), and "Addendum No. 2 to Work Plan for Site Assessment" (EST, March 26, 1997).

The scope of subsurface investigation at the CHT site included further (Phase 2) multi-depth soil gas survey work. Locations and depths of Phase 2 soil gas sampling probes were based on previous soil gas analyses results (EST, May 2, 1996). A total of two (2) 12-foot-deep, four (4) 15-foot-deep, four (4) 25-foot-deep, and two (2) 35-foot-deep soil gas probes were installed, located generally in the vicinity of the former vapor degreaser. Soil gas samples were subsequently collected from the probes and analyzed on-site for volatile organic compounds (VOCs) by a mobile laboratory.

Analyses results for multi-depth soil gas samples indicated the presence of chlorinated VOCs, primarily tetrachloroethene (PCE) and trichloroethene (TCE). Concentrations of PCE were detected in 12 of 12 soil gas samples, ranging from 21 micrograms per liter ($\mu\text{g/L}$) to a maximum of 1,948 $\mu\text{g/L}$ at approximately 35-feet below grade (Probe SG5-35). Concentrations of TCE were detected in 10 of 12 soil gas samples, ranging from 7 $\mu\text{g/L}$ to a maximum of 156 $\mu\text{g/L}$ at approximately 35-feet below grade (Probe SG5-35). Lesser concentrations of PCE and TCE degradation compounds, including vinyl chloride (maximum 55 $\mu\text{g/L}$), trans-1,2-dichloroethene (maximum 27 $\mu\text{g/L}$), cis-1,2-dichloroethene (maximum 124 $\mu\text{g/L}$) were detected in the Phase 2 soil gas samples.

Aromatic hydrocarbons, including benzene, toluene, ethylbenzene, and xylene (BTEX) were also detected in several Phase 2 soil gas samples. Benzene was detected in two soil gas samples collected from approximately 35-feet below grade in Probes SG5-35 and SG10-35 at concentrations of 91 $\mu\text{g/L}$ and 188 $\mu\text{g/L}$, respectively. Detected concentrations of toluene in soil gas ranged from 57 $\mu\text{g/L}$ to a maximum of 257 $\mu\text{g/L}$. Ethylbenzene was detected in one soil gas sample (Probe SG9-15) at a concentration of 4 $\mu\text{g/L}$. Xylene was detected in two soil gas samples at concentrations of 6 $\mu\text{g/L}$ and 18 $\mu\text{g/L}$.

Based on Phase 2 soil gas analyses results, a single soil boring was located inside the facility and advanced to groundwater using hollow-stem auger drilling methods. Groundwater was encountered at approximately 68 feet below current grade. Undisturbed soil samples were collected at approximate five-foot-intervals from the boring and screened for total organic vapors (TOVs) in the field. Soil samples were visually inspected and classified in the field using Unified Soil Classification (USCS) criteria.

Upon encountering first groundwater and completion of soil sampling, nested soil gas sampling probes were installed at approximately 50 and 60 feet below grade in the bore-hole during back-filling. Upon back-filling to approximately 45 feet below grade, a vapor extraction well was installed in the bore-hole to address VOC-impacted soil as indicated by prior soil gas analyses results. The vapor extraction well was completed slightly above grade using a traffic-rated well-cover set in concrete.

A total of 13 soil samples were collected from the boring and analyzed for VOCs by a state-certified environmental laboratory (Sierra Laboratories, Laguna Hills, California - ELAP No. 1805). Additionally, six (6) soil samples collected at approximate 10-foot-intervals from the boring were subjected to sieve analysis to verify visual soil classification performed during drilling.

Concentrations of PCE were detected in soil samples collected from 5 to 60 feet below grade. Detected concentrations of PCE in soil ranged from 4.8 micrograms per kilogram ($\mu\text{g/Kg}$) to a maximum of 130 $\mu\text{g/Kg}$ at approximately 60 feet below grade (sample CHT-B1-60). Concentrations of TCE were detected in soil samples collected from 5 to 30 feet below grade, and at approximately 40, 45, and 60 feet below grade. Detected concentrations of TCE in soil samples ranged from 3 $\mu\text{g/Kg}$ to a maximum of 20 $\mu\text{g/Kg}$ at approximately 5 feet below grade (sample CHT-B1-5). Concentrations of TCE were not detected above the laboratory method detection limit (MDL) of 3 $\mu\text{g/Kg}$ in soil samples collected from approximately 35, 50, 55, and 65 feet below grade. Concentrations of cis-1,2-dichloroethene (maximum 17 $\mu\text{g/Kg}$) were detected in two soil samples. Toluene was detected in one soil sample collected from approximately 60 feet below grade at a concentration of 6.5 $\mu\text{g/Kg}$.

1.0 INTRODUCTION

On March 10, 14, and 27, 1997, Environmental Support Technologies, Inc. (EST) performed further subsurface investigation at the Continental Heat Treating (CHT) facility located at 10643 South Norwalk Boulevard in Santa Fe Springs, California (Figure 1). This report was prepared to address requirements outlined by the Los Angeles County Fire Department (LACFD) in a letter to CHT dated August 6, 1996.

Site background information, results of previous (Phase 1) soil gas survey work (EST, May 2, 1996), rationale for Phase 2 soil gas sampling locations, and rationale for location of a soil boring were provided in the LACFD-approved "Remedial Investigation Work Plan" (Work Plan) (EST, September 27, 1996). Amendments to the Work Plan were proposed in "Remedial Investigation Work Plan Addendum" (EST, October 8, 1996) and "Addendum No. 2 to Work Plan for Site Assessment" (EST, March 26, 1997) which were subsequently approved by the LACFD.

The subsurface investigation was performed in accordance with the above-referenced work plan, the work plan addendums, and with Environmental Protection Agency (EPA)-recommended procedures for the collection, handling, and analysis of environmental samples.

2.0 SCOPE OF WORK

The scope of subsurface investigation included the following elements:

- Preparation of a Health and Safety Plan to guide the safe performance of work;
- Clearance of subsurface utilities;
- Further multi-depth soil gas survey work at an area of elevated concentrations of volatile organic compounds (VOCs) as indicated by Phase 1 soil gas survey results;
- Advancing a single soil boring to groundwater and collection of soil samples at five-foot-intervals for lithologic classification, field screening, and laboratory analyses;
- Installation of a vapor extraction well and nested soil gas sampling probes in the boring;
- State-certified laboratory analyses of soil samples for volatile organic compounds (VOCs) using EPA Method 8021;
- Sieve analysis of selected soil samples collected from the soil boring;
- Preparation of this Site Assessment Report.

3.0 PROJECT OBJECTIVES

The objectives of further subsurface investigation work were to:

- Assess the vertical extent of soil impacted by VOCs;
- Characterize subsurface lithology from grade to first-encountered groundwater;
- Assess current depth-to-groundwater;
- Evaluate the necessity of shallow soil remediation using Los Angeles Regional Water Quality Control Board (LARWQCB) criteria.

4.0 RATIONALE FOR SAMPLING LOCATIONS

Locations and depths of soil gas sampling probes installed on March 10 and 14, 1997 were based on results of prior soil sampling (Green Environmental, February 6, 1995) and on results of Phase 1 soil gas survey work (EST, May 2, 1996). The soil boring/vapor extraction well was located at an area of elevated concentrations of VOCs in soil gas as indicated by results of the Phase 2 multi-depth survey work performed on March 10 and 14, 1997. A plot plan of the CHT facility is shown in **Figure 2**.

5.0 FIELD METHODS AND PROCEDURES

Methods and procedures for soil gas survey work, subsurface utilities clearance, drilling, soil sampling, soil sample handling, soil sample field screening, soil sample chain-of-custody, and quality assurance/quality control data were provided in the previously referenced work plan (EST, September 27, 1996) and the Work Plan Addendums (EST, October 8, 1996 and March 26, 1997).

6.0 OBSERVATIONS AND RESULTS

Field measurements, observations, and laboratory analyses results for soil gas and soil samples are discussed in the following sections.

6.1 SOIL GAS ANALYSES RESULTS

Further (Phase 2) multi-depth soil gas survey work at CHT included the installation of two (2) 12-foot-deep, four (4) 15-foot-deep, four (4) 25-foot-deep, and two (2) 35-foot-deep soil gas sampling probes. The approximate locations of the soil gas probes are shown in **Figure 3**. Soil gas samples were collected from the multi-depth probes and analyzed for VOCs on-site using a mobile environmental laboratory. Analyses results for soil gas samples are summarized in **Table 1**. Laboratory analyses reports and quality assurance/quality control (QA/QC) data are provide in **Appendix A**.

Concentrations of chlorinated and aromatic VOCs were detected in soil gas sampled collected at the CHT site. Chlorinated VOCs detected in soil gas samples included vinyl chloride (VC), trans-1,2-dichloroethene (t-1,2-DCE), cis-1,2-dichloroethene (c-1,2-DCE), trichloroethene (TCE), and tetrachloroethene (PCE). Aromatic VOCs detected in soil gas samples included benzene, toluene, ethylbenzene, and total xylene (BTEX). Concentrations of PCE detected during the Phase 2 soil gas survey are posted in Figure 4. Results of soil gas analyses are discussed below.

6.1.1 Vinyl Chloride (VC)

Concentrations of VC were detected in 6 of 12 multi-depth soil gas samples. Detected concentrations of VC in soil gas ranged from 15 micrograms per liter ($\mu\text{g/L}$) in the sample collected from Probe SG1-12 (12-feet-deep) to a maximum of 55 $\mu\text{g/L}$ in the sample collected from Probe SG11-15 (15-feet-deep).

6.1.2 Trans-1,2-Dichloroethene (t-1,2-DCE)

Concentrations of t-1,2-DCE were detected in 4 of 6 multi-depth soil gas samples. Detected concentrations of t-1,2-DCE in soil gas ranged from 3 $\mu\text{g/L}$ in the sample collected from Probe SG1-12 to a maximum of 27 $\mu\text{g/L}$ in the sample collected from Probe SG5-15 (15-feet-deep).

6.1.3 Cis-1,2-Dichloroethene (c-1,2-DCE)

Concentrations of c-1,2-DCE were detected in 10 of 12 soil gas samples. Detected concentrations of c-1,2-DCE in soil gas ranged from 10 $\mu\text{g/L}$ in the sample collected from Probe SG9-15 (15-feet-deep) to a maximum of 124 $\mu\text{g/L}$ in the sample collected from Probe SG5-15.

6.1.4 Trichloroethene (TCE)

Concentrations of TCE were detected in 10 of 12 soil gas samples. Detected concentrations of TCE in soil gas ranged from 7 $\mu\text{g/L}$ in the sample collected from Probe SG1-12 (12-feet-deep) to a maximum of 156 $\mu\text{g/L}$ in the sample collected from Probe SG5-35 (35-feet-deep).

6.1.5 Tetrachloroethene (PCE)

Concentrations of PCE were detected in 12 of 12 soil gas samples. Detected concentrations of PCE in soil gas ranged from 21 $\mu\text{g/L}$ in the sample collected from Probe SG1-12 to a maximum of 1,948 $\mu\text{g/L}$ in Probe SG5-35.

6.1.6 Benzene

Benzene was detected in soil gas samples collected from Probes SG5-35 and SG10-35 at concentrations of 91 $\mu\text{g/L}$ and 188 $\mu\text{g/L}$, respectively.

6.1.7 Toluene

Concentrations of toluene were detected in 9 of 12 soil gas samples. Detected concentrations of toluene ranged from 57 $\mu\text{g/L}$ in Probe SG12-12 (12-feet-deep) to a maximum of 257 $\mu\text{g/L}$ in Probe SG11-25 (25-feet-deep).

6.1.8 Ethylbenzene

Ethylbenzene was detected in the soil gas sample collected from Probe SG9-15 (15-feet-deep) at a concentration of 4 $\mu\text{g/L}$.

6.1.9 Total Xylene

Total (meta + para + ortho) xylene was detected in soil gas samples collected from Probes SG5-15 (15-feet-deep) and SG9-15 (15-feet-deep) at concentrations of 6 $\mu\text{g/L}$ and 18 $\mu\text{g/L}$, respectively.

6.2 DRILLING, SOIL SAMPLING, AND INSTALLATION OF A VAPOR EXTRACTION WELL WITH NESTED SOIL GAS PROBES

Based on results of the Phase 2 soil gas survey, a single soil boring was advanced in the vicinity of the former vapor degreaser. The approximate location of the soil boring (CHT-B1) is shown (with detected Phase 2 soil gas concentrations of VOCs) in **Figure 4**. Per LACFD requirements, the location of Boring CHT-B1 was referenced to a fixed datum point. The datum point used to locate CHT-B1 was the intersection of the southern CHT property line with the curb-line of South Norwalk Boulevard. Soil boring CHT-B1 was located approximately 147 feet east of, and 118 feet north of the datum point. Details of proposed drilling and soil sampling were provided in the Work Plan (EST, September 27, 1996). Details of the proposed vapor extraction well installation with nested soil gas probes were provided in Work Plan Addendum No. 2 (EST, March 26, 1997). Construction detail of the vapor extraction well with nested probes is shown in **Figure 5**.

6.3 LITHOLOGIC CHARACTERIZATION OF SOIL

Soil samples collected from the boring were visually classified using Unified Soil Classification (USCS) criteria. USCS criteria are provided in **Appendix B**. Sieve analyses were performed on selected soil samples to verify field classifications. Laboratory reports for sieve analyses are provided in **Appendix C**. The soil boring log is provided in **Appendix D**.

The boring was advanced at a 5-inch-thick concrete-paved location inside the facility. Lithologic materials encountered from below concrete-paving material to the water table (encountered at approximately 68 feet below grade) were predominantly clayey-silts with fine-to medium-grained sands (USCS Classification SM-ML), silts (USCS Classification ML) and silty-clays with fine sands (USCS Classification ML-CL).

6.4 CHEMICAL CHARACTERIZATION OF SOIL

Soil samples were analyzed for VOCs using EPA Method 8021. Laboratory analyses results for soil samples are summarized in Table 2. Laboratory analyses reports and quality assurance/quality control data for soil samples are provided in Appendix E. A total of thirteen (13) soil samples were collected at 5-foot-intervals from soil boring CHT-B1 and analyzed for VOCs. Concentrations of PCE, TCE, c-1,2-DCE, and toluene were detected in soil samples collected from the soil boring. Results of soil sample analyses are discussed below.

6.4.1 PCE

Concentrations of PCE were detected in soil samples collected from 5- to 60-feet below grade. Detected concentrations of PCE ranged from 4.8 micrograms per kilogram ($\mu\text{g/Kg}$) in soil sample CHT-B1-50 (collected from approximately 50 feet below grade) to a maximum of 130 $\mu\text{g/Kg}$ in soil sample CHT-B1-60 (collected from approximately 60 feet below grade). PCE was not detected above the laboratory method detection limit (MDL) of 3 $\mu\text{g/Kg}$ in the soil sample collected from approximately 65 feet below grade (CHT-B1-65). Detected concentrations of PCE were variable with depth, and did not exhibit apparent increasing or decreasing trends.

6.4.2 TCE

Concentrations of TCE were detected in soil samples collected from 5- to 30-feet below grade, from 40- and 45-feet below grade, and at 60-feet below grade. Detected concentrations of TCE ranged from 3 $\mu\text{g/Kg}$ in soil sample CHT-B1-40 (collected from approximately 40 feet below grade) to a maximum of 20 $\mu\text{g/Kg}$ in soil sample CHT-B1-5 (collected from approximately 5 feet below grade). TCE was not detected above the laboratory method detection limit (MDL) of 3 $\mu\text{g/Kg}$ in soil samples collected from approximately 35-, 50-, 55-, and 65 feet below grade. Detected concentrations of TCE were variable with depth, and did not exhibit apparent increasing or decreasing trends.

6.4.3 C-1,2-DCE

C-1,2-DCE was detected in soil samples collected from approximately 30- (CHT-B1-30) and 50-feet (CHT-B1-50) below grade in the boring, at concentrations of 17 $\mu\text{g/Kg}$ and 17 $\mu\text{g/Kg}$, respectively. C-1,2-DCE was not detected above the MDL of 3 $\mu\text{g/Kg}$ in other soil samples collected from the boring.

6.4.4 Toluene

Toluene was detected in soil sample CHT-B1-60 at a concentration of 6.5 $\mu\text{g/Kg}$. Toluene was not detected above the MDL (3 $\mu\text{g/Kg}$) in other soil samples collected from the boring.

6.5 INVESTIGATION-DERIVED SOIL CUTTINGS

Soil cuttings generated by hollow-stem auger drilling were contained in five (5) steel 55-gallon drums. The soil containment drums were labeled, secured, and left on-site near the western exit of the building. Treatment or disposal of investigation-derived soil cuttings is the responsibility of CHT. EST will assist CHT in evaluating the most appropriate treatment/disposal options, if requested.

7.0 PROPOSED SOIL CLEAN-UP LEVELS

Proposed soil clean-up levels (SCLs) were calculated using the LARWQCB Attenuation Factor Method (LARWQCB, February 1996). The attenuation factor method consists of a series of equations, into which site-specific variables (including depth-to-groundwater, subsurface lithology, and the identity of the contaminant(s) are input.

Parameters used to calculate SCLs for the CHT site included depth-to-groundwater of 68 feet, silt lithology from grade to the water table, and PCE and TCE as contaminants. Proposed SCLs are presented in **Table 3**. Maximum detected values of PCE and TCE (excluding soil gas values for the northwest corner of the site due to potential off-site source) in soil and soil gas are summarized and compared to proposed SCLs in **Table 4**.

8.0 CONCLUSIONS

Soil in the vicinity of the former degreaser has been impacted primarily by PCE and TCE from grade to the water table, as indicated by analytical results for soil gas and soil samples. Concentrations of PCE and TCE detected in soil gas samples collected from approximately 5, 15, 25, and 35-feet below grade exceed proposed SCLs. Concentrations of PCE and TCE detected in soil samples collected from the boring are below proposed SCLs, with the exception of soil sample CHT-B1-60, collected from approximately 60 feet below grade.

REFERENCES

Marshack, Jon. B., September 1991. A Compilation of Water Quality Goals - A Staff Report of the California Regional Water Quality Control Board.

Environmental Support Technologies, Inc., November 20, 1995. Work Plan to Perform a Multi-Depth Soil Gas Survey - Continental Heat Treating Site - 10643 South Norwalk Boulevard, Santa Fe Springs, California.

Los Angeles Regional Water Quality Control Board, February 14, 1996. Interim Guidelines for Remediation of VOC-Impacted Sites.

Environmental Support Technologies, Inc., May 8, 1996. Multi-Depth Soil Gas Survey Report - Continental Heat Treating - 10643 South Norwalk Boulevard, Santa Fe Springs, California.

County of Los Angeles Fire Department, August 6, 1996. Letter to Continental Heat Treating reviewing results of May 8, 1996 soil gas survey report and requesting further site investigation and submittal of a Remedial Investigation Work Plan.

Environmental Support Technologies, Inc., September 27, 1996. Remedial Investigation Work Plan - Continental Heat Treating Site - 10643 South Norwalk Boulevard, Santa Fe Springs, California.

Environmental Support Technologies, Inc., October 8, 1996. Remedial Investigation Work Plan Addendum - Continental Heat Treating - 10643 South Norwalk Boulevard, Santa Fe Springs, California.

County of Los Angeles Fire Department, January 15, 1997. Letter to Continental Heat Treating stating review and approval of "Remedial Investigation Work Plan" and "Remedial Investigation Work Plan Addendum".

Environmental Support Technologies, Inc., March 26, 1997. Addendum No. 2 to Work Plan for Site Assessment - Continental Heat Treating - 10643 South Norwalk Boulevard, Santa Fe Springs, California.

County of Los Angeles Fire Department, March 28, 1997. Letter to Continental Heat Treating stating receipt, review, and approval of "Addendum No. 2 to Work Plan for Site Assessment".

TABLES

TABLE 1

p. 1 of 1

SUMMARY OF FIELD ANALYSES RESULTS FOR SOIL GAS SAMPLES

CONTINENTAL HEAT TREATING
10643 SOUTH NORWALK BOULEVARD
SANTA FE SPRINGS, CALIFORNIA

03/18/97

CHT SOIL GAS RESULTS

SAMPLING DATE	PROBE IDENTIFICATION	PROBE DEPTH (feet)	SAMPLING EVENTS	Chlorinated Hydrocarbons (ug/L)*					Aromatic Hydrocarbons (ug/L)*			
				VC	T-1,2-DCE	C-1,2-DCE	TCE	PCE	BENZENE	TOLUENE	EBENZ	XYLS
03/10/97	SG1-12	12	2	15	3	23	7	21	ND<1	ND<1	ND<1	ND<1
	SG5-15	15	5	50	27	124	105	1,151	ND<5	148	ND<5	6
	SG5-25	25	1	ND<50	ND<50	ND<50	ND<50	597	ND<50	ND<50	ND<50	ND<50
03/14/97	SG5-35	35	3	ND<25	ND<25	45	156	1,948	91	101	ND<25	ND<25
03/10/97	SG9-15	15	4	45	10	10	28	503	ND<1	214	4	18
	SG9-25	25	1	ND<20	ND<20	ND<20	ND<20	213	ND<20	123	ND<20	ND<20
	SG10-15	15	2	25	ND<10	24	33	118	ND<10	ND<10	ND<10	ND<10
	SG10-25	25	2	29	24	82	116	533	ND<5	87	ND<5	ND<5
03/14/97	SG10-35	35	3	ND<10	ND<10	26	103	1,172	188	144	ND<10	ND<10
03/10/97	SG11-15	15	1	55	ND<20	48	92	445	ND<20	208	ND<20	ND<20
	SG11-25	25	1	ND<20	ND<20	26	44	368	ND<20	257	ND<20	ND<20
	SG12-12	12	1	ND<10	ND<10	31	23	284	ND<10	57	ND<10	ND<10

* = Reported analyte concentrations are the highest detected in each probe within calibration range

ND = not detected above stated laboratory method detection limit (MDL)

(ug/L) = micrograms of compound per liter of soil gas

PCE = tetrachloroethene; synonym: perchloroethylene

XYLS = total (meta+para+ortho) xylene

T-1,2-DCE = trans-1,2-dichloroethene

C-1,2-DCE = cis-1,2-dichloroethene

EBENZ = ethylbenzene

TCE = trichloroethene

VC = vinyl chloride

TABLE 2

SUMMARY OF LABORATORY ANALYSES RESULTS FOR SOIL SAMPLES

CONTINENTAL HEAT TREATING
10643 SOUTH NORWALK BOULEVARD
SANTA FE SPRINGS, CALIFORNIA

04/09/97

CHT SOIL RESULTS

SAMPLE DATE	SAMPLE IDENTIFICATION	SAMPLE DEPTH (feet)	Detected EPA Method 8021 Analytes (ug/Kg)			
			Tetrachloroethene	Trichloroethene	c-1,2-DCE	Toluene
03/27/97	CHT-B1-5	5	40	20	ND<3	ND<3
	CHT-B1-10	10	31	9.6	ND<3	ND<3
	CHT-B1-15	15	110	17	ND<3	ND<3
	CHT-B1-20	20	42	14	ND<3	ND<3
	CHT-B1-25	25	29	7	ND<3	ND<3
	CHT-B1-30	30	50	9.4	17	ND<3
	CHT-B1-35	35	8.4	ND<3	ND<3	ND<3
	CHT-B1-40	40	16	3	ND<3	ND<3
	CHT-B1-45	45	27	4	ND<3	ND<3
	CHT-B1-50	50	4.8	ND<3	17	ND<3
	CHT-B1-55	55	5.2	ND<3	ND<3	ND<3
	CHT-B1-60	60	130	7.7	ND<3	6.5
	CHT-B1-65	65	ND<3	ND<3	ND<3	ND<3

(ug/Kg) = micrograms of compound per kilogram of soil

c-1,2-DCE = cis-1,2-dichloroethene

ND = not detected above stated laboratory method detection limit

TABLE 4

**COMPARISON OF MAXIMUM DETECTED VALUES OF PCE AND TCE
IN SOIL AND SOIL GAS WITH PROPOSED SOIL CLEAN-UP GOALS**

CHT COMPARISON TABLE

VOC	Tetrachloroethene (PCE)			Trichloroethene (TCE)		
BGS (feet)	Soil (ug/Kg)	Soil gas (ug/L)	SCL (ppb)	Soil (ug/Kg)	Soil gas (ug/L)	SCL (ppb)
0.5	7,514 (1)	----	NC	4,759 (1)	----	NC
5	40 (5)	240 (2)	209	20 (5)	246 (2)	42
10	31 (5)	----	181	9.6 (5)	----	36
15	110 (5)	1,151 (3)	150	17 (5)	105 (3)	30
20	42 (5)	----	121	14 (5)	----	24
25	29 (5)	597 (3)	91	7 (5)	116 (3)	18
30	50 (5)	----	69	9.4 (5)	----	14
35	8.4 (5)	1,948 (4)	60	ND<3 (5)	156 (4)	12
40	16 (5)	----	51	3 (5)	----	11
45	27 (5)	----	42	3 (5)	----	9
50	4.8 (5)	----	33	ND<3 (5)	----	7
55	5.2 (5)	----	24	ND<3 (5)	----	5
60	130 (5)	----	16	7.7 (5)	----	5
65	ND<3 (5)	----	6	ND<3 (5)	----	5

BGS = depth below ground surface

NC = not calculated

(ug/Kg) = micrograms of compound per kilogram of soil

(ug/L) = micrograms of compound per liter of soil gas

(ppb) = parts per billion

---- = not applicable

SCL = soil clean-up level (proposed)

(1) Green Environmental, 02/06/95

(2) Environmental Support Technologies, 05/02/96

(3) Environmental Support Technologies, 03/10/97

(4) Environmental Support Technologies, 03/14/97

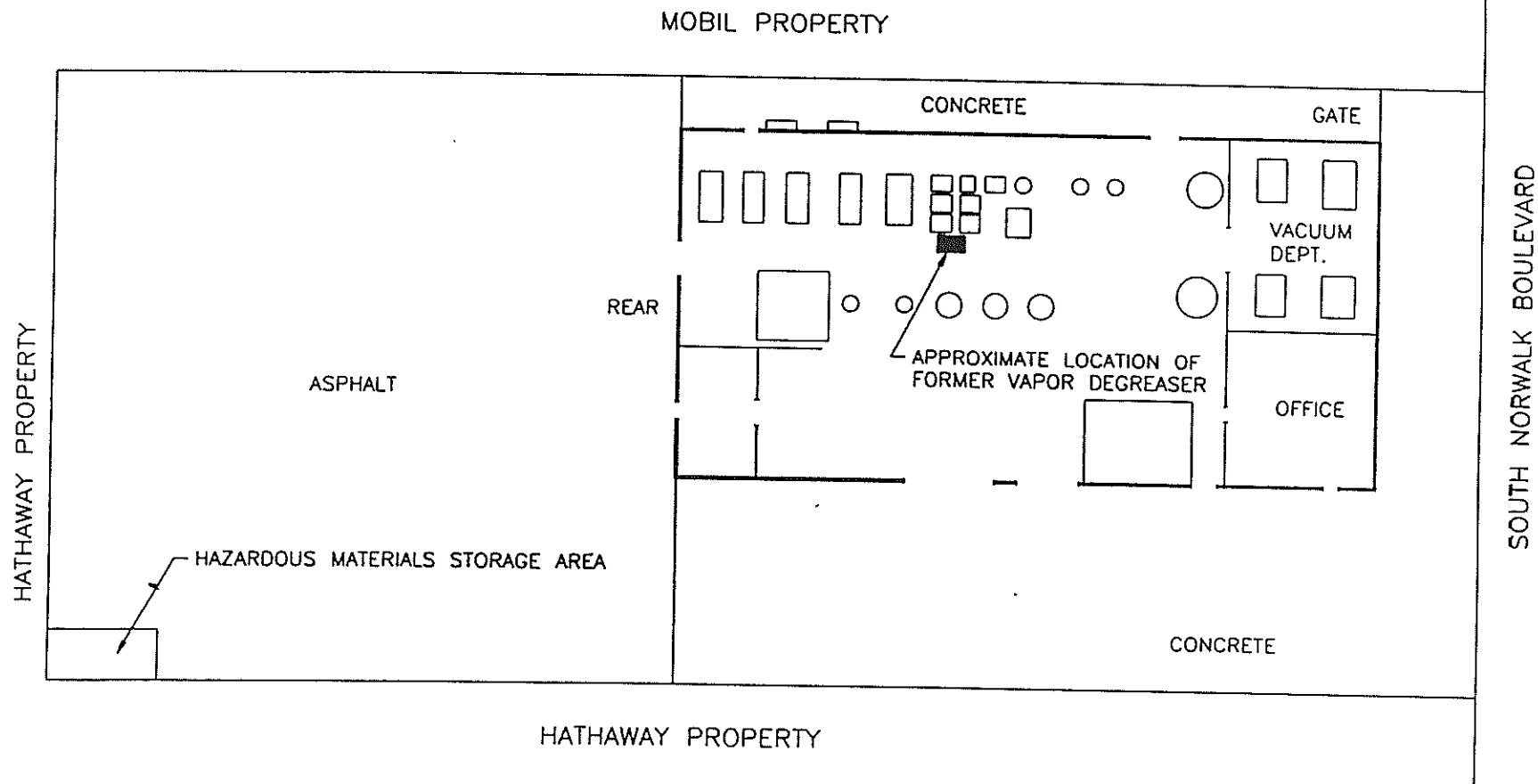
(5) Environmental Support Technologies, 03/27/97

FIGURES

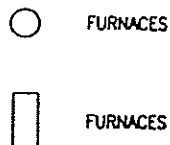


FIGURE 1
SITE LOCATION MAP
CONTINENTAL HEAT TREATING
SITE ASSESSMENT REPORT
EST1315

Source of Map: Thomas Bros., L.A. County, 1992



EXPLANATION

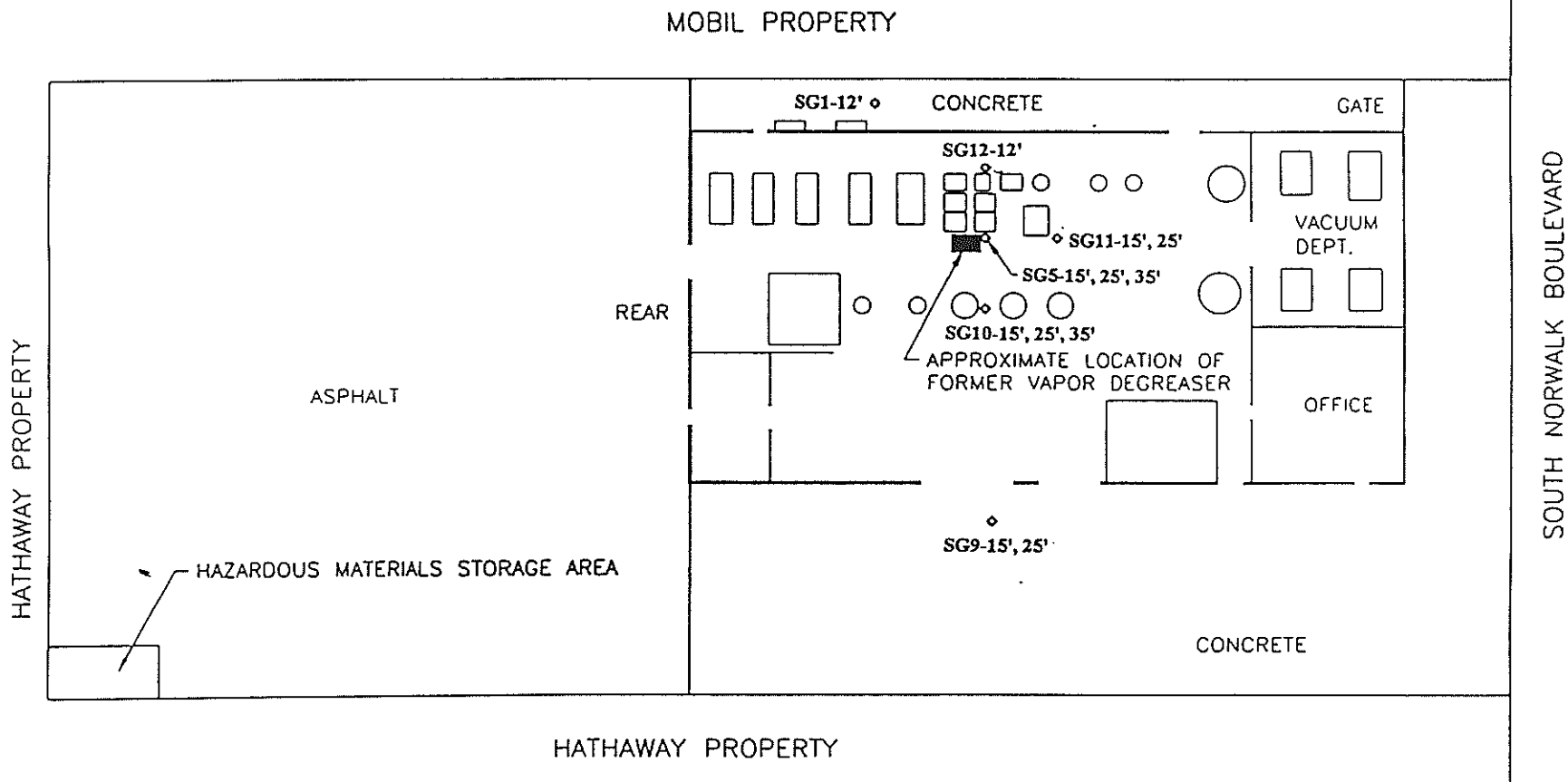


APPROXIMATE SCALE IN FEET

FIGURE 2

SITE MAP

CONTINENTAL HEAT TREATING, INC.
 10643 SOUTH NORWALK BOULEVARD
 SANTA FE SPRINGS, CALIFORNIA
 EST1315 / REMEDIAL INVESTIGATION WORK PLAN
 DRAWN BY: JST SCALE: AS SHOWN DATE: 9-27-1996



APPROXIMATE SCALE IN FEET

FIGURE 3
APPROXIMATE LOCATIONS OF PHASE 2
SOIL GAS SAMPLING PROBES

CONTINENTAL HEAT TREATING, INC.
 10643 SOUTH NORWALK BOULEVARD
 SANTA FE SPRINGS, CALIFORNIA
 EST1315

DRAWN BY: JST

SCALE: AS SHOWN

DATE: 4-16-97

SOIL BORING LOG

p.1 of 2

05/06/97

CHT BORING LOG

ENVIRONMENTAL SUPPORT TECHNOLOGIES, INC.
23011 MOULTON PARKWAY, SUITE C-6
LAGUNA HILLS, CALIFORNIA 92653
(714) 467-0664

PROJECT NAME: Continental Heat Treating					BORING NUMBER: CHT-B1			
PROJECT No: EST1315					BORING LOGGED BY: M. Tye			
DATE: 3/27/97					DRILLING CONTRACTOR: Discovery Drilling			
BEGIN DRILLING: 8:53 AM					DRILLING METHOD: CME-55 with 10.5-inch O.D. augers			
END DRILLING: 12:11 PM					SITE LOCATION: 10543 South Norwalk Boulevard, Santa Fe Springs, CA.			
TIME	DEPTH	BLOW COUNTS	PERCENT RECOVERY	TOVs (ppm)		LITHOLOGIC DESCRIPTION	USCS SOIL TYPE	LAB SAMPLE
7:40	0'	N/A	N/A	N/A		Surface = Concrete, approximately 5-inches-thick, hand-auger (HA) to 4-feet below grade.	N/A	N/A
7:42	1'	N/A	HA Cuttings	54 ppm as isobutylene		Silty fine sand, brown (10YR 4/3), well-sorted, moist, no odor.	SM	N/A
8:57	5'	21-27-35 (62)	100%	70 ppm as isobutylene		Clayey-silt with fine sand, brown (10YR 4/3), well-sorted very-dense, moist.	SM-ML	EPA 8021
9:10	10'	20-24-45 (69)	100%	58 ppm as isobutylene		Clayey-silt with fine sand, brown (10YR 4/3), well-sorted very-dense, moist.	SM-ML	EPA 8021 SIEVE
9:24	15'	30-40-70 (110)	100%	267 ppm as isobutylene		Silt, light brownish-gray (10YR 6/2), well-sorted, very-dense, moist.	ML	EPA 8021
9:33	20'	27-35-70 (105)	100%	45 ppm as isobutylene		Silty clay, light brownish-gray (10YR 6/2), well-sorted, very-dense, moist.	ML-CL	EPA 8021 SIEVE
9:45	25'	25-25-50 (75)	100%	48 ppm as isobutylene		Silty clay, pale brown (10YR 6/3), well-sorted, very-dense, moist.	ML-CL	EPA 8021
9:58	30'	28-27-55 (82)	100%	114 ppm as isobutylene		Silty clay, pale brown (10YR 6/3), well-sorted, very-dense, moist.	ML-CL	EPA 8021 SIEVE
10:06	35'	19-20-47 (87)	100%	50 ppm as isobutylene		Silty clay, pale brown (10YR 6/3), well-sorted, very-dense, moist.	ML-CL	EPA 8021
10:20	40'	17-19-45 (64)	100%	59 ppm as isobutylene		Silt, brown (10YR 4/3), well-sorted, very-dense, moist.	ML	EPA 8021 SIEVE
10:38	45'	20-22-52 (74)	100%	135 ppm as isobutylene		Silt, brown (10YR 4/3), well-sorted, very-dense, moist.	ML	EPA 8021
11:25	50'	24-27-59 (86)	100%	53 ppm as isobutylene		Silty clay, pale brown (10YR 6/3), well-sorted, very-dense, moist.	ML CL	EPA 8021 SIEVE

HSA = hollow-stem auger
TOV = total organic vapors
LAB = soil sample analyzed by certified laboratory
EPA 8021 = sample analyzed for VOCs
ppm = parts per million
(xx) = sum of last two blow counts

NS = not sampled
USCS = United Soil Classification System
ND = not detected
Archived = soil sample archived at laboratory
N/A = not applicable
SIEVE = sieve analysis performed

1) USCS Classifications are field derived.

2) Color designations are Munsell.

3) Subsurface information from boring logs depict conditions only at specific locations and dates indicated.
Soil conditions at other locations may differ from conditions at these locations. Also the conditions at these locations may change with time.

Prepared by: Michael TyeReviewed by: R.A. Thomson

SOIL BORING LOG

p.2 of 2

05/06/97

CHT BORING LOG (p.2)

ENVIRONMENTAL SUPPORT TECHNOLOGIES, INC.
23011 MOULTON PARKWAY, SUITE E-6
LAGUNA HILLS, CALIFORNIA 92653
(714) 457-0884

PROJECT NAME: Continental Heat Treating					BORING NUMBER: CHT-B1		
PROJECT No: EST1315					BORING LOGGED BY: M. Iye		
DATE: 3/27/97					DRILLING CONTRACTOR: Discovery Drilling		
BEGIN DRILLING: 8:53 AM					DRILLING METHOD: CME-55 with 10.5-inch O.D. augers		
END DRILLING: 12:11 PM					SITE LOCATION: 10643 South Norwalk Boulevard, Santa Fe Springs, CA.		
TIME	DEPTH	BLOW COUNTS	PERCENT RECOVERY	TOVs (ppm)	LITHOLOGIC DESCRIPTION	USCS SOIL TYPE	LAB SAMPLE
11:37	55'	20-25-28 (53)	100%	115 ppm as isobutylene	Clayey-silt, grayish-brown (10YR 5/2), well-sorted, very-dense, moist.	ML-CL	EPA 8021
11:56	60'	17-20-42 (62)	100%	25 ppm as isobutylene	Clayey-silt, grayish-brown (10YR 5/2), well-sorted, very-dense, moist.	ML CL	EPA 8021 SIEVE
12:08	65'	35-50-100 (150)	100%	19 ppm as isobutylene	Medium sand with silt, gray (10YR 6/1), well-sorted, very-dense, very moist.	SM	EPA 8021
12:11	68'	32-45-60 (125)	100%	15 ppm as isobutylene	Medium sand with silt, gray (10YR 6/1), well-sorted, very-dense, wet.	SM	N/A
					DISCONTINUE DRILLING AND SOIL SAMPLING.		
					Total depth of boring CHT-B1 approximately 68-feet below grade, commence installation of nested soil gas probes at 60 and 50 feet below grade, and installation of 45-foot-deep vapor extraction well.		

HSA = hollow-stem auger
TOV = total organic vapors
LAB = soil sample analyzed by certified laboratory
EPA 8021 = sample analyzed for VOCs
ppm = parts per million
(xx) = sum of last two blow counts

NS = not sampled
USCS = United Soil Classification System
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Soil conditions at other locations may differ from conditions at these locations. Also the conditions at these locations may change with time.

Prepared by Michael IyeReviewed by R.D. Thomson

Continental
Heat
Treating, Inc.

10643 S. Norwalk Blvd.
Santa Fe Springs
California 90670
562-944-8808
800-622-6624
FAX 562-944-1499

Ms. Blythe Ponck-Bacharowski
Manager Site Cleanup II
State of California
Regional Water Quality Control Board
320 West 4th Street
Suite 200
Los Angeles, CA 90013

May 4, 2001

Re: Continental Heat Treating, Inc.
10643 S. Norwalk Blvd. Santa Fe Springs, CA 90670
Request of Regional Water Quality Control Board Oversight

Dear Ms. Ponck-Bacharowski

Continental Heat Treating, Inc. ("CHT") is the tenant in possession of the subject property. The property is owned by the Anna A. Hathaway Revocable Trust ("Landowner"). CHT has operated its heat treating business on subject property, pursuant to lease agreements with the landowner, since 1969. CHT historically used perchloroethylene ("PCE") to degrease metal parts. Investigations of the subject property indicate that CHT's use of PCE may have impacted the soil. The impacted soils are defined in the central plant building area (Impacted Soil"). Copies of the prior investigation reports are enclosed for your convenience.

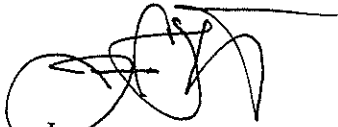
Under separate cover, CHT is submitting to the Regional Water Quality Control Board ("RWQCB") a workplan to remediate the Impacted Soil in the area of the former PCE degreaser which was located in the central plant area.

CHT recognized that the Regional Water Quality Control Board ("RWQCB") recovers its cleanup oversight costs pursuant to Porter-Cologne, Section 13304. CHT requests the RWQCB provide CHT with the requisite forms to initiate the RWQCB cleanup oversight in connection with CHT's proposed Impacted Soil remediation in the area of the former PCE degreaser which was located in the central plant area.

Please note that the subject property appears to have been impacted in other areas by the former operation on a property located North. CHT is not responsible for the investigation or cleanup of the contaminants resulting from the adjacent property.

Thank you for your assistance and cooperation in this matter. If any questions arise,
please call.

Sincerely,



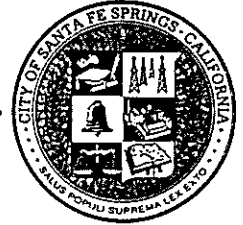
James Stull

JS/LR

cc: Mr. Eric Wu
Mr. Chip Graham
Joseph Obegi Esq.
Mr. Bob Schneider

Fire Department CITY OF SANTA FE SPRINGS

HEADQUARTERS FIRE STATION • (562) 944-9713 • FAX (562) 941-1817
11300 GREENSTONE AVE. • SANTA FE SPRINGS 90670-4619



Mr. Greg Holmes, Unit Chief
Site Mitigation Operations
Southern California Branch A
State Department of Toxic Substances Control
245 W. Broadway, Suite 350
Long Beach, CA 90802-4444

February 11, 1998

Dear Mr. Holmes:

**SUBJECT: CONTINENTAL HEAT TREAT, 10643 S. NORWALK BOULEVARD,
SANTA FE SPRINGS, CA 90670**

**"JALK FEE"/MOBIL LEASE SITE, IMMEDIATELY NORTH OF THE
CONTINENTAL HEAT TREAT SITE, SANTA FE SPRINGS, CA 90670**

The Santa Fe Springs Fire Department (SFSFD) has completed a preliminary review of data regarding both of the subject sites. Based on this review, the SFSFD has determined that halogenated volatile organic compound (HVOC) and other contamination is present on both of these sites, either in or constituting a significant threat to groundwater, as well as at levels exceeding soil contamination action levels. Cross-parcel soil contamination from the Jalk Fee site appears likely.

There appears to be a need for further assessment to determine the lateral and vertical extent of the contamination. Also, HVOC contamination above the MCL's in microgram quantities is demonstrated in groundwater beneath the Continental Heat Treat facility likely due to historic releases from a former degreasing tank.

In a recent telephone conversation, Steve Chase of the SFSFD discussed these sites with Mr. Joe Cully of your staff, and advised him that referral of these sites to your agency appeared to be appropriate. The sites have also been discussed with a representative of the Los Angeles Regional Water Quality Control Board.

Based on our review of the known data, the SFSFD is therefore referring these sites to your agency for appropriate action. The SFSFD finds reason for great concern regarding actual and potential groundwater threats and high levels of soil contamination posing a potential threat to public health of the citizens of City of Santa Fe Springs as well as in the larger community and asks that your agency expedite all necessary corrective action.

The SFSFD has enclosed a summary of the known data for your convenience, and requests that you keep this agency informed of your actions at these sites.

Mr. Greg Holmes, Unit Chief
February 11, 1998
Page 2

Should you have any questions about this matter, please contact Steve Chase of this office. He can be reached at (562) 944-9713.

Sincerely,

NORBERT P. SCHNABEL, FIRE CHIEF



David R. Klunk,
Director of Environmental Services

DK/sc

c: Mr. Dennis Dickerson, Executive Officer, Los Angeles Regional Water Quality Control Board,
101 Centre Plaza Drive, Monterey Park, CA 91754

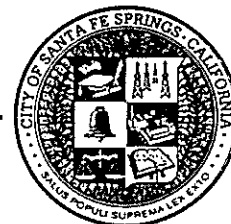
Mr. James Stull, Continental Heat Treating Inc., 10643 S. Norwalk Blvd.,
Santa Fe Springs, CA 90670

Mr. Chris Welsh, Property Manager, 2130 Santiago Drive, Newport Beach, CA 92660

Mr. Tom Walker
Mobil Exploration and Producing U.S. Inc.
10735 S. Shoemaker Ave., Santa Fe Springs, CA 90670

Fire Department CITY OF SANTA FE SPRINGS

HEADQUARTERS FIRE STATION • (562) 944-9713 • FAX (562) 941-1817
11300 GREENSTONE AVE. • SANTA FE SPRINGS 90670-4619



Mr. Dennis Dickerson
Executive Officer
Los Angeles Regional Water Quality Control Board
101 Centre Plaza Drive
Monterey Park, CA 91754

February 11, 1998

Dear Mr. Dickerson:

**SUBJECT: CONTINENTAL HEAT TREAT, 10643 S. NORWALK BOULEVARD,
SANTA FE SPRINGS, CA 90670**

**"JALK FEE"/MOBIL LEASE SITE, IMMEDIATELY NORTH OF THE
CONTINENTAL HEAT TREAT SITE, SANTA FE SPRINGS, CA 90670**

The Santa Fe Springs Fire Department (SFSFD) has completed a preliminary review of data regarding both of the subject sites. Based on this review, the SFSFD has determined that halogenated volatile organic compound (HVOC) and other contamination is present on both of these sites, either in or constituting a significant threat to groundwater, as well as at levels exceeding soil contamination action levels. Cross-parcel soil contamination from the Jalk Fee site appears likely.

There appears to be a need for further assessment to determine the lateral and vertical extent of the contamination. Also, HVOC contamination above the MCL's in microgram quantities is demonstrated in groundwater beneath the Continental Heat Treat facility likely due to historic releases from a former degreasing tank.

In a recent telephone conversation, Steve Chase of the SFSFD discussed these sites with Ms. Manjulika Chakrabarti of your staff, who indicated that our referral of these issues to your agency is appropriate, and indicated that your staff has been working toward mitigation of PCE and other contamination at the JF site.

Based on our review of the known data, the SFSFD is therefore referring these sites to your agency for appropriate action. The SFSFD finds reason for great concern regarding actual and potential groundwater threats and the potential threat to public health of the citizens of City of Santa Fe Springs as well as in the larger community and asks that your agency expedite all necessary corrective action.

The SFSFD has enclosed a summary of the known data for your convenience, and requests that you keep this agency informed of your actions at these sites.

Mr. Dennis Dickerson
February 11, 1998
Page 2

Should you have any questions about this matter, please contact Steve Chase of this office. He can be reached at (562) 944-9713.

Sincerely,

NORBERT P. SCHNABEL, FIRE CHIEF



David R. Klunk,
Director of Environmental Services

DK/sc

c: Mr. Greg Holmes, Unit Chief, Site Mitigation Operations, Southern California Branch A,
State Department of Toxic Substances Control, 245 S. Broadway, Suite 350,
Long Beach CA 90802-4444

Mr. James Stull, Continental Heat Treating Inc., 10643 S. Norwalk Blvd.,
Santa Fe Springs, CA 90670

Mr. Chris Welsh, 2130 Santiago Drive, Newport Beach, CA 92660

Mr. Tom Walker
Mobil Exploration and Producing U.S. Inc.
10735 S. Shoemaker Ave., Santa Fe Springs, CA 90670

**Continental
Heat
Treating, Inc.**

10643 S. Norwalk Blvd.
Santa Fe Springs
California 90670
310-944-8808
800-622-6624
310-944-1499 (FAX)

Dec 19, 1997

Dave Klunk
Director of Environmental Service
Fire Department
City of Santa Fe Springs
11300 Greenstone Ave.
Santa Fe Springs, CA 90670

Subject: Request for work plan.

Dear Mr. Klunk;

I received a letter from you dated September 12, 1997 which requested a work plan for additional investigation on contamination at the northwest corner of the property on which Continental Heat Treating is located. Since the receipt of that letter we have been coordinating with Steve Chase. This letter is a confirmation to the last conversation he had with our representative concerning this request.

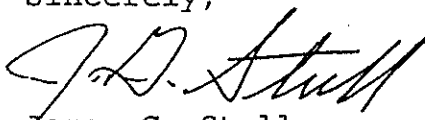
Prior to the transfer of oversight of our facility from the Los Angeles County Fire Department to Santa Fe Springs I was told that the contamination in the northwest corner of my property was being handled by others. As a result I was not asked to address this area during previous investigations.

Your request has prompted Continental Heat Treating and a representative of the property owner to further investigate the status of the investigations that have been conducted at the adjacent property. I have attached a summary of the review of these documents to you.

Based on the data and information contained in the site investigations for the property to our north we have decided not to submit a work plan. We believe there can be no conclusions to the extent to contamination on your property unless there is further investigation conducted on the Mobil site located to the north.

If you have any questions please contact me.

Sincerely,


James G. Stull



Trilogy

Regulatory Services

15011 Turtle Pond Ct., Chino Hills, CA 91709
Phone: (909) 597-7024 / FAX: (909) 597-0566

Dec. 7, 1997

To: James G. Stull
Continental Heat Treating, Inc.
10643 S. Norwalk Blvd.
Santa Fe Spring, CA 90670

To: Chris A. Welsh
901 Dover Drive, Suite 210
Newport Beach, CA 92660

Subject: Review of Mobil Site Investigations

The Santa Fe Springs Fire Department has requested that Continental Heat Treating to provide a work plan to determine if the PCE contamination at the northwest corner of the property poses a risk to ground water. If there were no potential for ground water contamination Santa Fe Springs would continue to provide oversight for the soil investigation and clean up. High concentrations at depths near ground water would result in the Santa Fe Springs Fire Department referring the site to the Regional Water Quality Control Board (RWQCB).

Soil contamination to the north of this location has also been reported on the Mobil property located at 10607 South Norwalk Blvd. which is adjacent to the Continental/Hathaway property located at 10643 South Norwalk Blvd. In subsequent conversations with Steve Chase who is managing Continental Heat Treating file at Santa Fe Springs, I was told that the RWQCB has the oversight on the Mobil property.

I have reviewed analytical information concerning the Mobil property contained in reports dated Dec. 6, 1991 prepared by Levine-Fricke titled Subsurface Soil Investigation and Nov. 15, 1994 prepared by McLaren/Hart Environmental Engineering Corporations titled Limited Subsurface Investigation. These were provided to me as public access documents in file at the RWQCB. The following are my observations and a summary of the information contained in these documents.

1. An assessment was referenced in the McLaren/Hart investigation which was conducted by Woodward-Clyde Consultants in 1998. That document was reported to indicate that there were solvent odors and vapor discharges from a boring in the eastern section of the Site.
2. The Levine-Fricke investigation indicated that during discussions with Mobil it was reported "that the eastern portion of the site was leased at one time to a company that used solvents along that portion of the site."
3. The McLaren/Hart investigation provides addition information on the prior lease use stating that "The southern boundary of the leased property was approximately 70 feet north of the PCE impacted area (which is adjacent to the southern boundary of the Jalk Fee property.)" (Jalk Fee is the name in the reports use to describe the Mobil facility.) This statement appears to be an attempt to show distance between the prior solvent using operations at the facility and the known contamination. The highest concentrations of PCE and TCE found at the site during this investigation were 50' north of the southern boundary of the facility with detection of PCE as far as 100' north of the southern boundary. This would indicate that portions of the contamination are located at or near the prior leased portion of the facility.
4. The Levine-Fricke report concludes that the contamination on the southwest corner of the Mobil property may have resulted from run off from the uncontained tanks located adjacent to this area on the Continental/Hathaway property. In a prior paragraph they correctly state that the surface run off is from north to south which is in conflict with this conclusion. They also fail to recognize in their report that the tanks they are referring to contain nitrogen and hydrogen.
5. High concentrations of PCE and TCE were found at three distinct locations on the property, one of which the Levine-Fricke report indicates was in connection with a tank farm located on the property.
6. The dept of high concentrations of PCE and TCE on the Mobil property adjacent to the northwest corner of the Continental/Hathaway property were found at a depths ranging from 6' to 10'. This indicates that the contamination is a result of surface releases and not from migration from elsewhere.

Conclusion

There is a high potential that the contamination at the northwest corner of the property originates from the Mobil property to the north. The current levels of contamination found on the Continental/Hathaway property are above action levels which would require remediation.

Additional characterization of the contamination and/or remediation is not feasible at this site if the potential source and adjacent areas are not addressed at the same time.

Please contact me if you have any questions.

Sincerely,

Robert W. Schneider
REA 03003

**Continental
Heat
Treating, Inc.**

10643 S. Norwalk Blvd.
Santa Fe Springs
California 90670
310-944-8808
800-622-6624
310-944-1499 (FAX)

77
September 24, 1997

Dave Klunk
Director of Environmental Services
Fire Dept. of Santa Fe Springs
11300 Greenstone Avenue
Santa Fe Springs, Ca. 90670

RE: Letter Dated 9-12-97
Subject: Request for Clean Closure Letter
CONTINENTAL HEAT TREATING, INC.
10643 S. Norwalk Blvd.
Santa Fe Springs, Ca. 90670

Dear Mr. Klunk,

In your letter you have requested information concerning contamination found at the northwest corner of the Continental Heat Treating, Inc. facility described as SG14. During the previous investigations conducted under the oversight of the Los Angeles Fire Department it was our understanding that this area was being addressed by the property owner.

Prior to proceeding with your request we would like to determine the status of the actions that have been taken concerning this area and if a lead oversight agency has been assigned.

Jim Stull, who is the Continental Heat Treating, Inc. point of contact with the property owner, is currently out of the country and is expected to return about October 1, 1997. This may delay our ability to respond in the time period you have requested. We have discussed this situation with Steve Chase of your department and we will continue to work with him on this issue.

If you have any questions, please contact Bob Schneider at (909) 597-7024.

Sincerely,



Dee Grams
Controller

cc: Steve Chase
Environmental Services
Fire Dept of Santa Fe Springs
11300 Greenstone Avenue
Santa Fe Springs, Ca. 90670

Fire Department CITY OF SANTA FE SPRINGS

HEADQUARTERS FIRE STATION • (310) 844-2713 • FAX (310) 844-1617
11300 GREENSTONE AVE. • SANTA FE SPRINGS, 90670-4612



James G. Stull, President
Continental Heat Treating, Inc.
10643 S. Norwalk Blvd.
Santa Fe Springs, CA 90670

September 12, 1997

Dear Mr. Stull:

SUBJECT: REQUEST FOR CLEAN CLOSURE LETTER
CONTINENTAL HEAT TREATING, INC.
10743 SOUTH NORWALK BOULEVARD, SANTA FE SPRINGS, CA
906760

The Santa Fe Springs Fire Department (SFSFD) has completed a review of the report entitled "Site Assessment Report", dated May 6, 1997, submitted by your consultant, EST, and the letter to you of May 27, 1997, from the Los Angeles County Fire Department, Health Hazardous Materials Division, Site Mitigation Unit. The available data indicates that known PCE and TCE contamination around the location of the former vapor degreaser is below current soil cleanup action levels, although the data indicates a column of PCE contamination sufficient to threaten groundwater, from 40 ug/Kg @ 5' below ground surface (bgs) to 5 ug/Kg @ 55' bgs, increasing to 130 ug/Kg @ 60' bgs. First groundwater was reported at 63' bgs.

Also, the available data from soil gas studies indicates the presence of PCE in soils on the northwest corner of the site (SG 14), at levels which represent around 41 mg/Kg soil @ 15' bgs. This contamination is considerably above current soil screening action levels, and may also represent a threat to ground water. We understand that this site is already referred to the Los Angeles Regional Water Quality Control Board (LARWQCB). Based on the available data to date, the SFSFD cannot issue a closure letter at this time.

Before the SFSFD would consider further oversight at this site, the SFSFD would require evaluation of groundwater threat from known halogenated volatile organic compound (HVOC) contamination found at SG 14. This would require installation of a soil boring to groundwater with undisturbed soil samples taken every 5' and at significant changes in lithology, and with groundwater sampling. The samples would have to be taken, handled, analyzed, and reported in accordance with Los Angeles Regional Water Quality Control Board (LARWQCB) standards. Soil sample analyses by EPA Method 8260 and groundwater analyses by currently RWQCB-approved GC/MS screening method would be required. Installation of this boring as a monitoring well to RWQCB standards is advised. Any of this work would have to be in accordance with a workplan approved by the SFSFD. Current guidance used by the SFSFD includes the State Department of Toxic Substances Control (DTSC) Preliminary Endangerment Assessment Manual (PEA), as well as LARWQCB analytical and reporting standards.

Page 2
James G. Stull, President
September 12, 1997

If the additional data indicated that there was no significant threat to groundwater from contamination at SG 14, the SFSFD would consider oversight of further site assessment and corrective action at your site, which could result in a letter from the SFSFD stating that the soils at the site appear to meet current cleanup guidelines based upon available data. However, the LARWQCB may determine that residual contamination poses a risk to groundwater under their regulations.


If you desire the SFSFD proceed, please submit a workplan for the additional boring by October 15, 1997, for review and approval by the SFSFD. If we do not receive this workplan by that date, the SFSFD will refer this site to the DTSC for appropriate action.

Following review of the data from this additional work, the SFSFD will explore oversight options under current law, which involve approval of the DTSC and the LARWQCB for local agency oversight at this time.

If you have any questions re this matter, please contact Steve Chase of this office.

Sincerely,

NORBERT P. SCHNABEL, FIRE CHIEF



Dave Klunk,
Director of Environmental Services

DK/sc

CC: J.E. Ross, LARWQCB

Is your RETURN ADDRESS completed on the reverse side?

SENDER: • Complete items 1 and/or 2 for additional services. • Complete items 3, 4a, and 4b. • Print your name and address on the reverse of this form so that we can return this card to you. • Attach this form to the front of the mailpiece, or on the back if space does not permit. • Write "Return Receipt Requested" on the mailpiece below the article number. • The Return Receipt will show to whom the article was delivered and the date delivered.		I also wish to receive the following services (for an extra fee): 1. <input type="checkbox"/> Addressee's Address 2. <input type="checkbox"/> Restricted Delivery Consult postmaster for fee.	
3. Article Addressed to: GREG HOLMES, UNIT CHIEF SITE MITIGATION CLEANUP OPERATIONS DEPT. OF TOXIC SUBSTANCE CONTROL 245 WEST BROADWAY, SUITE 425 LONG BEACH, CA. 90802-444		4a. Article Number P 327 572 083	
		4b. Service Type <input type="checkbox"/> Registered <input checked="" type="checkbox"/> Certified <input checked="" type="checkbox"/> Express Mail <input type="checkbox"/> Insured <input type="checkbox"/> Return Receipt for Merchandise <input type="checkbox"/> COD	
		7. Date of Delivery 7/17	
5. Received By: (Print Name)		8. Addressee's Address (Only if requested and fee is paid)	
6. Signature: (Addressee or Agent) X <i>Vanessa Taylor</i>			

Thank you for using Return Receipt Service.



Trilogy

Regulatory Services

15011 Turtle Pond Ct., Chino Hills, CA 91709
Phone: (909) 597-7024 / FAX: (909) 597-0566

July 12, 1997

Dee Grams
Continental Heat Treating, Inc.
10643 Norwalk Blvd.
Santa Fe Springs, CA 90670

Subject: Nonemergency Hazardous Substance Release Report

Dee;

Enclosed are two copies of the Nonemergency Hazardous Substance Release Report which must be submitted to the Department of Toxic Substances. Sign the report where indicated and mail it certified return receipt requested it to the address on the attached sample transmittal letter. Keep the second copy in the subsurface investigation file.

Please give me a call if you have any questions.

Sincerely,

Robert W. Schneider
REA 03003

July 14, 1997

Greg Holmes, Unit Chief
Site Mitigation Cleanup Operations
Department of Toxic Substances Control
245 West Broadway, Suite 425
Long Beach, CA 90802-4444

Re: Continental Heat Treating, Inc.
10643 Norwalk Blvd.
Santa Fe Springs, CA 90670

Subject: Nonemergency Hazardous Substance Release Report

Dear Mr. Holmes;

Enclosed is the Nonemergency Hazardous Substance Release Report requested by your office.

If you have any questions or require any additional information please contact Bob Schneider at (909) 597-7024

Sincerely,

Dee Grams

DEPARTMENT OF TOXIC SUBSTANCES CONTROL
NONEMERGENCY HAZARDOUS SUBSTANCE RELEASE REPORT
(Health and Safety Code Section 25359.4)

State Use Only:

Regional Log #

A. Release discovered on (date): March 20, 1995 (See Attached Narrative)

Are any hazardous substances, as defined by Health and Safety Code Section 25316, currently spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping, or disposing into the environment: Yes _____ No ☒ XX

B. Have any hazardous substances, as defined by Health and Safety Code Section 25316, spilled, leaked, pumped, poured, emitted, emptied, discharged, injected, escaped, leached, dumped, or disposed into the environment: Yes XX No

C. If you respond yes to A. or B., is/are the release(s) of a Reportable Quantity as established by Section 302.4 of Code of Federal Regulations: Yes XX No

Is/are the release(s) of a Reportable Quantity as defined by Health and Safety Code Section 25359.4 (c)(2): Yes XX No

Indicate date of each occurrence if known (indicate Reportable Quantity amount if applicable):
Date of release(s) is not known.

(Prepare separate report for each release)

D. Person Reporting: Dee Grams

Phone: (310) 944-8808

Association with site (e.g., owner, operator, business representative, other): Office Manager

E. Site Name: Continental Heat Treating, Inc.

Site Address: 10643 S. Norwalk Blvd.
Santa Fe Springs, CA 90670

Site Phone: (310) 944 - 8808

Mailing Address (if different than above):

City: _____ County: _____

Site Contact Person: Bob Schneider Phone (909) 597 - 7024

DEPARTMENT OF TOXIC SUBSTANCES CONTROL
NONEMERGENCY HAZARDOUS SUBSTANCE RELEASE REPORT
(Health and Safety Code Section 25359.4)

II. RELEASE SITE

A. Release Site: Pipeline ☐ Shipyard ☐ Road ☐ Oilfield ☐ Refinery ☐ Railroad ☐
Service Station ☐ Residential ☐ Vacant Lot ☐ Industrial Plant (type) Heat Treating
Above-ground Tank ☐ Underground Storage Tank ☐ Other (describe) _____

B. What media do the contaminants affect: Air ☐ Groundwater ☐ Surface Water ☐ Soil XX

Proximity to surface water, groundwater, wetlands or storm drains if known:

Ground water depth was determined to be 68' with contaminants found at 60'. No surface water, wetlands or storm drains involved.

Surrounding area: Industrial XX Commercial XX Residential ☐ Rural ☐

Did the release occur near a school, residential area or other sensitive environment: Yes ☐ No XX

Describe: The facility is located in an industrial, commercial area of Santa Fe Springs. (See Attached Figure 1, Site Location Map)

C. Describe (briefly) the major types of contaminants released or found at the site: _____
Trichloroethene and Tetrachloroethene

(Add additional pages as necessary)

Quantity/Volume Released: Estimated Release Quantity Attached at Figure 3

Extent of Contamination (approximate physical diameter of the contamination, e.g., 3 meters wide by 9 meters long): Contamination centered in an area approximately 48' in diameter based on a soil gas survey conducted.

Describe (briefly) the location(s) of the contaminants: Contaminants found beneath an area where a vapor degreaser had operated at the facility. The equipment was removed in 1995. (See Site Map at Figure 2.)

(Add additional pages and map as necessary)

D. Describe (briefly) how the contamination came to exist at the site (for example, were there past spills, landfill operations, industrial wastewater operations, industrial wastewater systems, underground storage tanks, deposition of fill material, etc): Contamination is believed to have been caused by the operation of a vapor degreaser.

(Add additional pages and map as necessary)

DEPARTMENT OF TOXIC SUBSTANCES CONTROL
NONEMERGENCY HAZARDOUS SUBSTANCE RELEASE REPORT
(Health and Safety Code Section 25359.4)

III. SITE REMEDIATION

A. Has an environmental assessment been conducted: Yes XX No _____

Briefly describe results: Soil contamination found to a depth of 60' beneath the location where the vapor degreaser had operated. Soil gas and soil sampling showing contamination approximately in a 48' diameter.

(Add additional pages as necessary)

Assessment conducted by: Environmental Support Technologies, Inc.

Contact Person: Michael Tye

Phone number: (714) 457 -- 9664

B. Was the release contained or remediated: Yes _____ No XX

Briefly describe any cleanup actions (i.e., capping, removal actions, groundwater pump and treat systems, etc):
The degreaser and solvents that had been used in the degreaser have been removed from the facility to prevent any additional releases.

(Add additional pages as necessary)

C. If applicable, which phase(s) of the remediation process have been completed or are currently being performed:

☒ Preliminary Assessment/
Site Investigation (PA/SI) or
Preliminary Endangerment
Assessment (PEA)

☐ Removal or Remedial Action
☐ Remedial Investigation Workplan
☐ Feasibility Report

☐ Remedial Action Plan

☐ Remedial Design

☐ Operation and
Maintenance

☐ Other _____

D. Have you entered into any administrative/judicial orders and/or agreements: Yes _____ No XX

Date of order/agreement: See Attached Narrative

Name of Agency: Los Angeles County Fire Department

Agency Contact: George Baker

Agency Phone (213) 890 -- 4109

DEPARTMENT OF TOXIC SUBSTANCES CONTROL
NONEMERGENCY HAZARDOUS SUBSTANCE RELEASE REPORT
(Health and Safety Code Section 25359.4)

IV. EMERGENCY ACTIONS

A. Was an emergency action taken: Yes ____ No XX See Attached Narrative

Did you report the release to any local agencies: Yes ____ No ____

If yes, what local agencies were notified: _____

B. Did you report the release to any State agencies: Yes ____ No XX See Attached Narrative

If yes, which one(s): _____

C. Were Proposition 65 notification(s) made: Yes ____ No XX

To what agency (include agency phone number): _____

Date Proposition 65 notification(s) were made: _____

V. SIGNATURE

To the best of my knowledge and belief, the information stated in this report is accurate and complete.

(Signature of Preparer)

(Date Signed)

Dee Grams

(Typed or Printed Name)

Office Manager

Continental Heat Treating, Inc.
10643 S. Norwalk Blvd.
Santa Fe Spring, CA 90670

July 14, 1997

Supporting Narrative

Non-emergency Hazardous Substance Release Report

Section 1. Release

A. The discover date identified is the date of a Site Investigation Report prepared for the facility. The investigation was initiated in 1994 at the request the Los Angeles County Fire Department. A Work Plan was approved by that agency in Nov. 1994 which outlined the scope of the investigation. The results of this investigation confirmed the presence of a release which was reported to the Los Angeles County Fire Department.

Section III. Site Remediation

D. The investigation that has been conducted was initiated at the request of the Los Angeles County Fire Department which was the oversight agency. As of July 1, 1997 the responsibility for oversight has transferred to Santa Fe Springs Certified Unified Program Agency. Continental Heat Treating, Inc. will continue to work with the responsible oversight agency to resolve the issues related to this release.

Section IV. Emergency Action

A. The discovery of the release was not during the event and did not involve emergency actions.

B. The results of the Site Investigation Report and Site Assessment Report were reported to the Los Angeles County Fire Department.

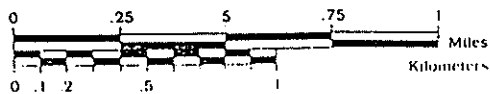
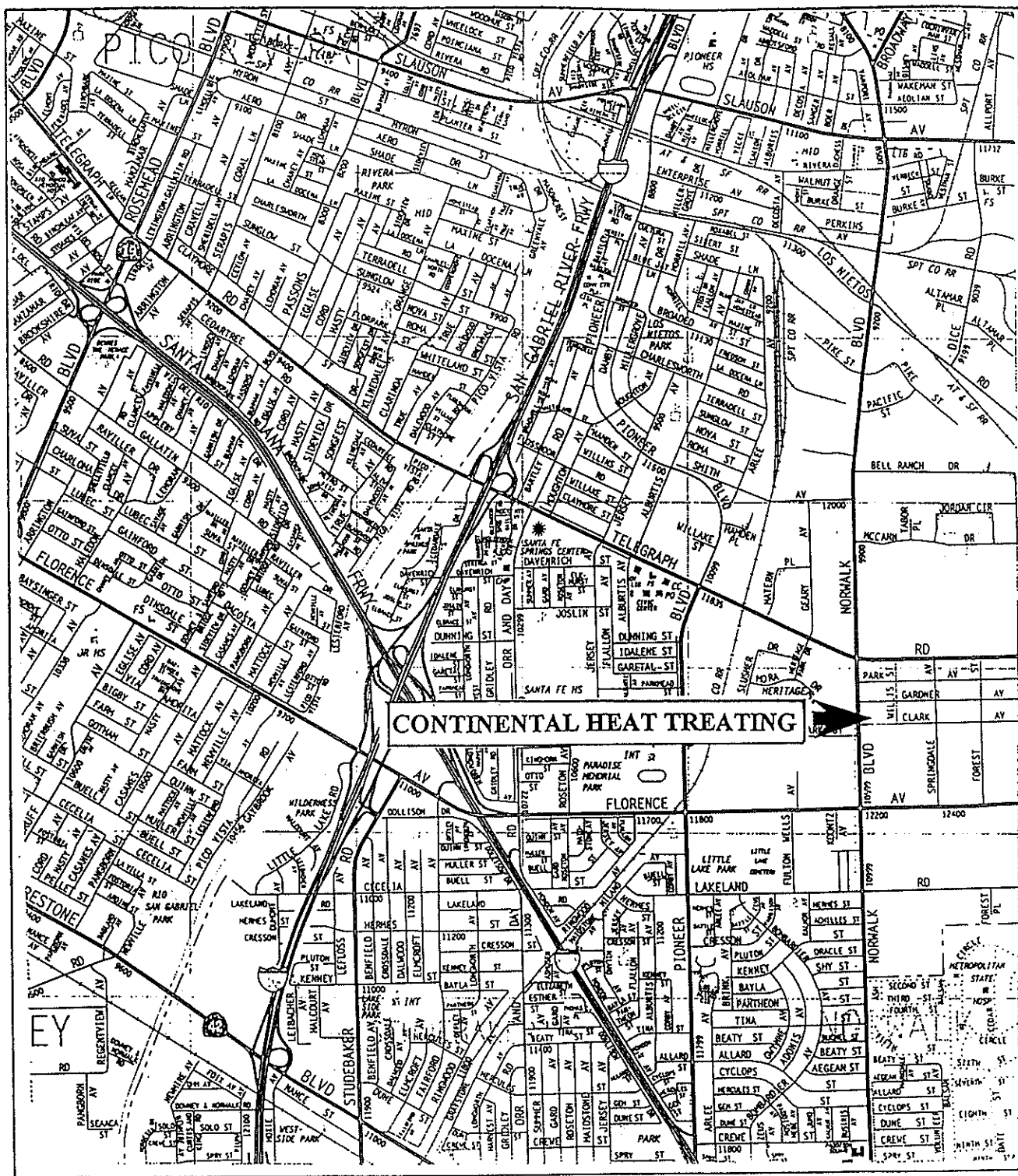
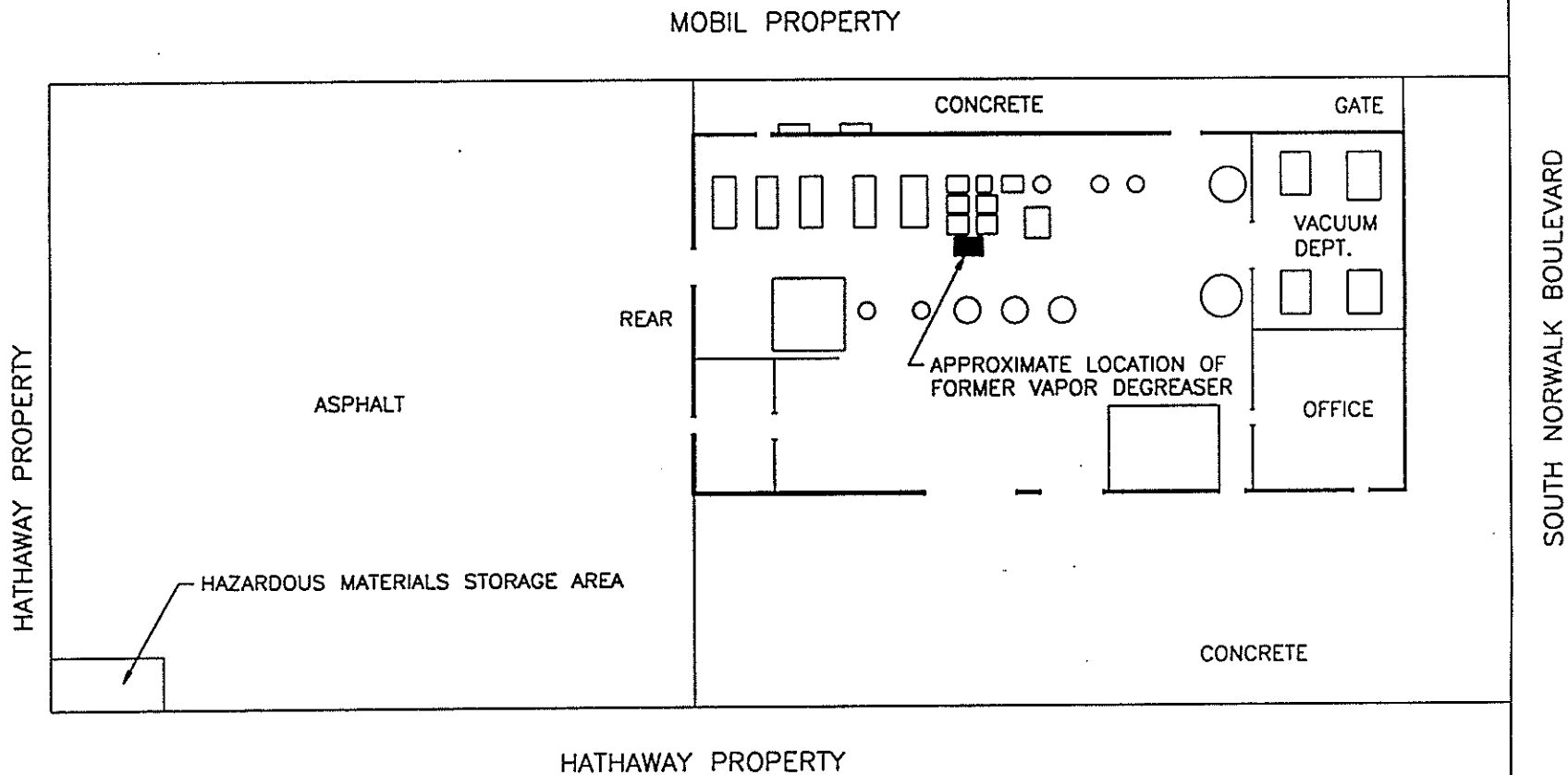


FIGURE 1
SITE LOCATION MAP
CONTINENTAL HEAT TREATING
SITE ASSESSMENT REPORT
EST1315

Source of Map: Thomas Bros., L.A. County, 1992



HATHAWAY PROPERTY

EXPLANATION

- FURNACES
- FURNACES



APPROXIMATE SCALE IN FEET

FIGURE 2

SITE MAP

CONTINENTAL HEAT TREATING, INC.
 10643 SOUTH NORWALK BOULEVARD
 SANTA FE SPRINGS, CALIFORNIA
 EST1315 / REMEDIAL INVESTIGATION WORK PLAN
 DRAWN BY: JST SCALE: AS SHOWN DATE: 9-27-1996

Figure 3

Continental Heat Treating

10643 S. Norwalk Blvd.
Santa Fe Springs, CA 90670

Estimated Release Quantity

Area of contamination is estimated to be approximately in a 48' by 48' diameter to a depth of 60'. For purposes of calculation a 48' X 48' X 60' area was assumed.

Calculations; 5120 yds of soil at 1.35 tons per yd.
1224 kg per yd = total of 6,266,880 kg.

Lab Report 4/4/97

	PCE ug/kg	TCE ug/kg	Sample Depth In Feet
	40	20	5
	31	10	10
	110	17	15
	42	14	20
	29	7	25
	50	9	60
	8	0	35
	16	3	40
	27	4	45
	5	0	50
	5	0	55
	130	8	60
Total	493	92	
Average	41	8	
Ave. Value See Note	21	4	
	128732160	24023040 ug/kg total	
	128.73	24.02 Converted to Kg	
	2.20462	2.20462 lb per kg.	
	284	53 lbs of release	

Note: Average value assumes highest concentration at center point to 0 at 24 ft from center.



June 18, 1997

Cal/EPA

Department of
Toxic Substances
Control

Pete Wilson
Governor

James M. Strock
Secretary for
Environmental
Protection

45 West Broadway,
Suite 425
Long Beach, CA
90802-4444

Mr. James G. Stull, President
Continental Heat Treating, Inc.
10643 South Norwalk Boulevard
Santa Fe Springs, California 90670

Dear Mr. Stull:

**NONEMERGENCY HAZARDOUS SUBSTANCE RELEASE REPORT -
CONTINENTAL HEAT TREATING, INC., 10743 SOUTH NORWALK
BOULEVARD, SANTA FE SPRINGS, CALIFORNIA 90670**

The Department of Toxic Substances Control (DTSC) received a copy of the May 27, 1997 letter from the Los Angeles County Fire Department, Health Hazardous Materials Division, Site Mitigation Unit, which indicates a possible nonemergency release of a reportable quantity of hazardous substance at the above mentioned site.

In order to fulfill the reporting requirements, please complete the enclosed Nonemergency Hazardous Substances Release Report Form and submit it to DTSC within 30 days of receiving this letter. Based on the information provided, DTSC may require a Preliminary Endangerment Assessment (PEA) to be performed. If you wish to enter into a PEA/Voluntary Cleanup Agreement at this time, please complete the enclosed voluntary Cleanup Program (VCP) application form, submit it to DTSC at the above letterhead address, and contact Mr. Don Johnson at (818) 551-2862.

If you have any questions regarding this correspondence, please contact me at (562) 590-4918.

Sincerely,

Greg Holmes
Unit Chief
Site Mitigation Cleanup Operations
Southern California Branch A

Enclosure
Certified Mail
cc: See next page



Printed on Recycled Paper

Mr. James G. Stull

June 18, 1997

Page 2

cc: Mr. Thomas W. Klinger, Supervisor (w/out enclosure)
Los Angeles County Fire Department
Health Hazardous Materials Division
Site Mitigation Unit
1320 North Eastern Avenue
Los Angeles, California 90063-3294



COUNTY OF LOS ANGELES

FIRE DEPARTMENT

1320 NORTH EASTERN AVENUE
LOS ANGELES, CALIFORNIA 90063-3294

Refer reply to:

P. MICHAEL FREEMAN
FIRE CHIEF
FORESTER & FIRE WARDEN

HEALTH HAZARDOUS MATERIALS DIVISION
5825 Rickenbacker Rd
Commerce CA 90040-3027

June 3, 1997

J. E. Ross,
Los Angeles Regional Water Quality Control Board
101 Centre Plaza Drive
Monterey Park, CA 91754

Dear Mr. Ross:

**SUBJECT: CONTINENTAL HEAT TREATING INC., 10643 S. NORWALK BLVD.,
SANTA FE SPRINGS, CA 90670**

This letter is to refer a hazardous material release site with a present or likely imminent groundwater impact to your agency's attention and lead agency oversight.

Findings from a subsurface investigation of the subject site ("Site Assessment Report," dated May 6, 1997) document a maximum 130 $\mu\text{g/Kg}$ PCE soil contamination at 60' below ground surface (bgs), with on-site groundwater discovered at 68' bgs. From these results, sufficient evidence exists that on-site sources may have contributed to contamination of groundwater resources.

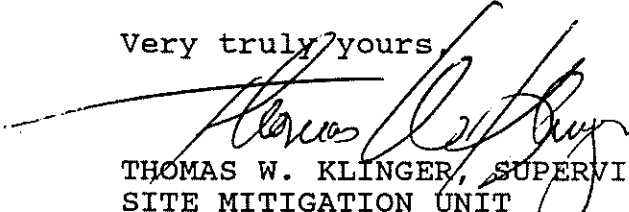
As of July 1, 1997, the Santa Fe Springs Fire Department is the only local agency with enforcement authority over the Hazardous Waste Control Law (CA H&SC Division 20, Chap. 6.5) in their city. All active and closed Site Mitigation Unit (SMU) cases/files in the Santa Fe Springs jurisdiction are being referred to that local agency. Consistent with previous referral protocols between our agencies, however, sites with confirmed and/or threatened groundwater resource impact are transferred to your agency and/or the Department of Toxic Substances Control (DTSC).

All historical records of this case are being transferred to the Santa Fe Springs Certified Unified Program Agency (CUPA). Dave Klunk, Director of Environmental Protection, Santa Fe Springs Fire Department, 11300 Greenstone Ave., Santa Fe Springs, CA 90670-4619 is now in receipt of these case files.

J. E. Ross
June 3, 1997
Page 2

If you have any questions, please feel free to call George Baker
at (213) 890-4109.

Very truly yours,



THOMAS W. KLINGER, SUPERVISOR
SITE MITIGATION UNIT
HEALTH HAZARDOUS MATERIALS DIVISION

TK:gb

c: J. G. Stull, Continental Heat Treating, Inc.
D. Klunk, SFSFD



COUNTY OF LOS ANGELES

FIRE DEPARTMENT

1320 NORTH EASTERN AVENUE
LOS ANGELES, CALIFORNIA 90063-3294

Refer reply to:

P. MICHAEL FREEMAN
FIRE CHIEF
FORESTER & FIRE WARDEN

HEALTH HAZARDOUS MATERIALS DIVISION
5825 Rickenbacker Rd
Commerce CA 90040-3027

May 27, 1997

James G. Stull, President
Continental Heat Treating, Inc.
10643 S. Norwalk Blvd.
Santa Fe Springs, CA 90670

Dear Mr. Stull:

**SUBJECT: CONTINENTAL HEAT TREATING, INC., 10743 SOUTH NORWALK
BOULEVARD, SANTA FE SPRINGS, CA 90670**

This Department has completed a review of the report entitled "Site Assessment Report," dated May 6, 1997, submitted by your consultant, EST. This report documents probable tetrachloroethylene (PCE) contamination of first groundwater.

On-site groundwater was encountered at 68' below ground surface (bgs), with significant PCE-contamination still present at 60' bgs. Only one "non-detect" soil sample (at 65' bgs) is noted and the 68' bgs sample was not analyzed. Therefore, there is a lack of sufficient (usually a minimum 20') vertical clean earth interval/zone for volatile organic compounds (VOCs) above known groundwater.

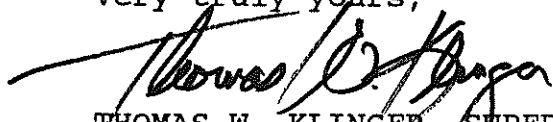
Based on this data, it is evident that a groundwater monitoring well(s) installation is needed to determine the extent of suspected groundwater contamination and any subsequent remediation which may be required.

As previously discussed, your case file is presently being transferred to the new Certified Unified Program Agency (CUPA) of the Santa Fe Springs Fire Department (SFSFD). As of July 1, 1997, SFSFD will be the only local agency with hazardous material/waste enforcement authority in the city of Santa Fe Springs. Due to the likely impact of the above-mentioned releases to groundwaters of the state, site conditions are concurrently being referred to Cal/EPA agencies (Department of Toxic Substances Control [DTSC] and the Los Angeles Regional Water Quality Control Board [RWQCB]). It is expected that Board staff will review site data and issue site-specific assessment/mitigation orders.

J. G. Stull, President
May 27, 1997
Page 2

If you have any questions, please feel free to call George Baker
at (213) 890-4109.

Very truly yours,

A handwritten signature in black ink, appearing to read "Thomas W. Klinger", is written over the typed name and title.

THOMAS W. KLINGER, SUPERVISOR
SITE MITIGATION UNIT
HEALTH HAZARDOUS MATERIALS DIVISION

TK:gb

c: M. Tye, EST
D. Klunk, SFSFD
J. E. Ross, RWQCB
G. Holmes, DTSC



COUNTY OF LOS ANGELES

FIRE DEPARTMENT

1320 NORTH EASTERN AVENUE
LOS ANGELES, CALIFORNIA 90063-3294

Refer reply to:

P. MICHAEL FREEMAN
FIRE CHIEF
FORESTER & FIRE WARDEN

HEALTH HAZARDOUS MATERIALS DIVISION
5825 Rickenbacker Rd
Commerce CA 90040-3027

June 3, 1997

J. E. Ross,
Los Angeles Regional Water Quality Control Board
101 Centre Plaza Drive
Monterey Park, CA 91754

Dear Mr. Ross:

SUBJECT: CONTINENTAL HEAT TREATING INC., 10643 S. NORWALK BLVD.,
SANTA FE SPRINGS, CA 90670

This letter is to refer a hazardous material release site with a present or likely imminent groundwater impact to your agency's attention and lead agency oversight.

Findings from a subsurface investigation of the subject site ("Site Assessment Report," dated May 6, 1997) document a maximum 130 µg/Kg PCE soil contamination at 60' below ground surface (bgs), with on-site groundwater discovered at 68' bgs. From these results, sufficient evidence exists that on-site sources may have contributed to contamination of groundwater resources.

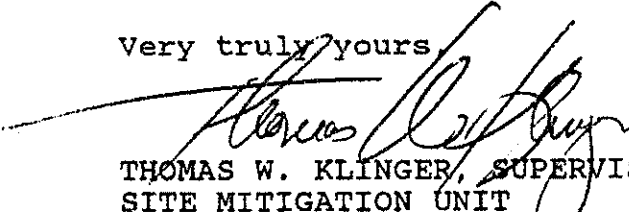
As of July 1, 1997, the Santa Fe Springs Fire Department is the only local agency with enforcement authority over the Hazardous Waste Control Law (CA H&SC Division 20, Chap. 6.5) in their city. All active and closed Site Mitigation Unit (SMU) cases/files in the Santa Fe Springs jurisdiction are being referred to that local agency. Consistent with previous referral protocols between our agencies, however, sites with confirmed and/or threatened groundwater resource impact are transferred to your agency and/or the Department of Toxic Substances Control (DTSC).

All historical records of this case are being transferred to the Santa Fe Springs Certified Unified Program Agency (CUPA). Dave Klunk, Director of Environmental Protection, Santa Fe Springs Fire Department, 11300 Greenstone Ave., Santa Fe Springs, CA 90670-4619 is now in receipt of these case files.

J. E. Ross
June 3, 1997
Page 2

If you have any questions, please feel free to call George Baker
at (213) 890-4109.

Very truly yours,



THOMAS W. KLINGER, SUPERVISOR
SITE MITIGATION UNIT
HEALTH HAZARDOUS MATERIALS DIVISION

TK:gb

c: J. G. Stull, Continental Heat Treating, Inc.
D. Klunk, SFSFD



COUNTY OF LOS ANGELES

FIRE DEPARTMENT

1320 NORTH EASTERN AVENUE
LOS ANGELES, CALIFORNIA 90063-3294

Refer reply to:

P. MICHAEL FREEMAN
FIRE CHIEF
FORESTER & FIRE WARDEN

HEALTH HAZARDOUS MATERIALS DIVISION
5825 Rickenbacker Rd
Commerce CA 90040-3027

May 27, 1997

James G. Stull, President
Continental Heat Treating, Inc.
10643 S. Norwalk Blvd.
Santa Fe Springs, CA 90670

Dear Mr. Stull:

**SUBJECT: CONTINENTAL HEAT TREATING, INC., 10743 SOUTH NORWALK
BOULEVARD, SANTA FE SPRINGS, CA 90670**

This Department has completed a review of the report entitled "Site Assessment Report," dated May 6, 1997, submitted by your consultant, EST. This report documents probable tetrachloroethylene (PCE) contamination of first groundwater.

On-site groundwater was encountered at 68' below ground surface (bgs), with significant PCE-contamination still present at 60' bgs. Only one "non-detect" soil sample (at 65' bgs) is noted and the 68' bgs sample was not analyzed. Therefore, there is a lack of sufficient (usually a minimum 20') vertical clean earth interval/zone for volatile organic compounds (VOCs) above known groundwater.

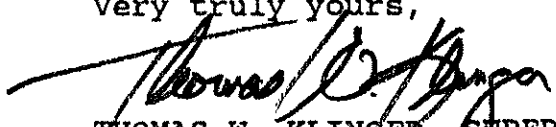
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J. G. Stull, President
May 27, 1997
Page 2

If you have any questions, please feel free to call George Baker
at (213) 890-4109.

Very truly yours,



THOMAS W. KLINGER, SUPERVISOR
SITE MITIGATION UNIT
HEALTH HAZARDOUS MATERIALS DIVISION

TK:gb

c: M. Tye, EST
D. Klunk, SFSFD
J. E. Ross, RWQCB
G. Holmes, DTSC



SITE ASSESSMENT REPORT

**CONTINENTAL HEAT TREATING
10643 SOUTH NORWALK BOULEVARD
SANTA FE SPRINGS, CALIFORNIA**

Prepared for:

**Continental Heat Treating
10643 South Norwalk Boulevard
Santa Fe Springs, California 90221**

Prepared by:

**ENVIRONMENTAL SUPPORT TECHNOLOGIES, INC.
23011 Moulton Parkway, Suite E-6
Laguna Hills, California 92653
(714) 457-9664
Fax (714) 457-0664**

Project No. EST1315

May 6, 1997

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SITE ASSESSMENT REPORT

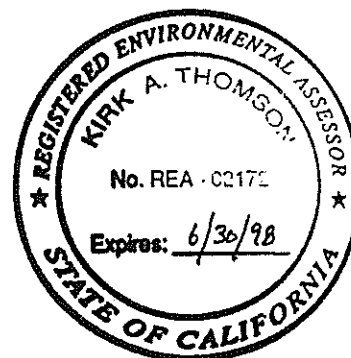
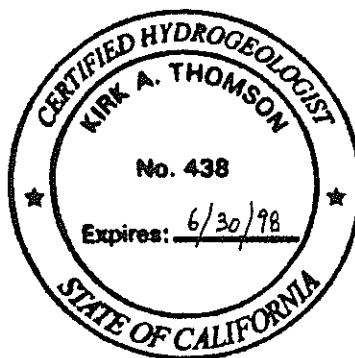
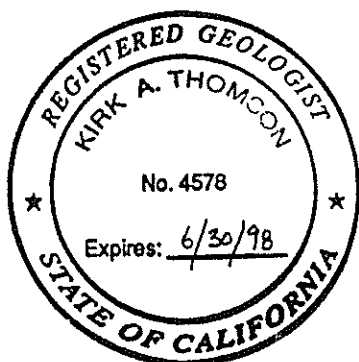
Continental Heat Treating
10643 South Norwalk Boulevard
Santa Fe Springs, California

WARRANTIES AND LIMITATIONS

This Site Assessment Report was prepared by Environmental Support Technologies, Inc. (EST) for the exclusive use of Continental Heat Treating and assigned interested parties. The services described within this document were performed in accordance with generally accepted professional consulting principles and practices. No other warranty, expressed or implied, is made.

The information contained in this report was based on measurements performed in specific areas during a specific time period. EST's professional opinions and conclusions are based in part on interpretation of data from discrete sampling or measurement locations that may not represent actual conditions at unsampled or unmeasured locations.

EST assumes no responsibility for issues arising from changes in environmental standards, practices, or regulations subsequent to performance of site assessment work. In the event that any changes occur in waste management practices, site conditions, or uses of the property, the conclusions and recommendations contained in this document should be reviewed and modified or verified in writing by EST. EST does not warrant the accuracy of information supplied by others, nor the use of segregated portions of this document.



Kirk A. Thomson

Kirk Thomson, R.G., C.H.G., R.E.A., M.S.
Project Manager/Principal Hydrogeologist

Michael E. Tye

Michael E. Tye
Project Hydrogeologist

May 6, 1997

EXECUTIVE SUMMARY

On March 10, 14, and 27, 1997, Environmental Support Technologies, Inc. (EST) performed site assessment work at the Continental Heat Treating (CHT) facility located at 10643 South Norwalk Boulevard in Santa Fe Springs, California. Recent site assessment work was performed to address requirements set forth by the Los Angeles County Fire Department (LACFD) in a letter to CHT dated August 6, 1996. The site investigation was performed in accordance with the LACFD-approved "Remedial Investigation Work Plan" (EST, September 26, 1996), "Remedial Investigation Work Plan Addendum" (EST, October 8, 1996), and "Addendum No. 2 to Work Plan for Site Assessment" (EST, March 26, 1997).

The scope of subsurface investigation at the CHT site included further (Phase 2) multi-depth soil gas survey work. Locations and depths of Phase 2 soil gas sampling probes were based on previous soil gas analyses results (EST, May 2, 1996). A total of two (2) 12-foot-deep, four (4) 15-foot-deep, four (4) 25-foot-deep, and two (2) 35-foot-deep soil gas probes were installed, located generally in the vicinity of the former vapor degreaser. Soil gas samples were subsequently collected from the probes and analyzed on-site for volatile organic compounds (VOCs) by a mobile laboratory.

Analyses results for multi-depth soil gas samples indicated the presence of chlorinated VOCs, primarily tetrachloroethene (PCE) and trichloroethene (TCE). Concentrations of PCE were detected in 12 of 12 soil gas samples, ranging from 21 micrograms per liter ($\mu\text{g/L}$) to a maximum of 1,948 $\mu\text{g/L}$ at approximately 35-feet below grade (Probe SG5-35). Concentrations of TCE were detected in 10 of 12 soil gas samples, ranging from 7 $\mu\text{g/L}$ to a maximum of 156 $\mu\text{g/L}$ at approximately 35-feet below grade (Probe SG5-35). Lesser concentrations of PCE and TCE degradation compounds, including vinyl chloride (maximum 55 $\mu\text{g/L}$), trans-1,2-dichloroethene (maximum 27 $\mu\text{g/L}$), cis-1,2-dichloroethene (maximum 124 $\mu\text{g/L}$) were detected in the Phase 2 soil gas samples.

Aromatic hydrocarbons, including benzene, toluene, ethylbenzene, and xylene (BTEX) were also detected in several Phase 2 soil gas samples. Benzene was detected in two soil gas samples collected from approximately 35-feet below grade in Probes SG5-35 and SG10-35 at concentrations of 91 $\mu\text{g/L}$ and 188 $\mu\text{g/L}$, respectively. Detected concentrations of toluene in soil gas ranged from 57 $\mu\text{g/L}$ to a maximum of 257 $\mu\text{g/L}$. Ethylbenzene was detected in one soil gas sample (Probe SG9-15) at a concentration of 4 $\mu\text{g/L}$. Xylene was detected in two soil gas samples at concentrations of 6 $\mu\text{g/L}$ and 18 $\mu\text{g/L}$.

Based on Phase 2 soil gas analyses results, a single soil boring was located inside the facility and advanced to groundwater using hollow-stem auger drilling methods. Groundwater was encountered at approximately 68 feet below current grade. Undisturbed soil samples were collected at approximate five-foot-intervals from the boring and screened for total organic vapors (TOVs) in the field. Soil samples were visually inspected and classified in the field using Unified Soil Classification (USCS) criteria.

Upon encountering first groundwater and completion of soil sampling, nested soil gas sampling probes were installed at approximately 50 and 60 feet below grade in the bore-hole during back-filling. Upon back-filling to approximately 45 feet below grade, a vapor extraction well was installed in the bore-hole to address VOC-impacted soil as indicated by prior soil gas analyses results. The vapor extraction well was completed slightly above grade using a traffic-rated well-cover set in concrete.

A total of 13 soil samples were collected from the boring and analyzed for VOCs by a state-certified environmental laboratory (Sierra Laboratories, Laguna Hills, California - ELAP No. 1805). Additionally, six (6) soil samples collected at approximate 10-foot-intervals from the boring were subjected to sieve analysis to verify visual soil classification performed during drilling.

Concentrations of PCE were detected in soil samples collected from 5 to 60 feet below grade. Detected concentrations of PCE in soil ranged from 4.8 micrograms per kilogram ($\mu\text{g/Kg}$) to a maximum of 130 $\mu\text{g/Kg}$ at approximately 60 feet below grade (sample CHT-B1-60). Concentrations of TCE were detected in soil samples collected from 5 to 30 feet below grade, and at approximately 40, 45, and 60 feet below grade. Detected concentrations of TCE in soil samples ranged from 3 $\mu\text{g/Kg}$ to a maximum of 20 $\mu\text{g/Kg}$ at approximately 5 feet below grade (sample CHT-B1-5). Concentrations of TCE were not detected above the laboratory method detection limit (MDL) of 3 $\mu\text{g/Kg}$ in soil samples collected from approximately 35, 50, 55, and 65 feet below grade. Concentrations of cis-1,2-dichloroethene (maximum 17 $\mu\text{g/Kg}$) were detected in two soil samples. Toluene was detected in one soil sample collected from approximately 60 feet below grade at a concentration of 6.5 $\mu\text{g/Kg}$.

1.0 INTRODUCTION

On March 10, 14, and 27, 1997, Environmental Support Technologies, Inc. (EST) performed further subsurface investigation at the Continental Heat Treating (CHT) facility located at 10643 South Norwalk Boulevard in Santa Fe Springs, California (**Figure 1**). This report was prepared to address requirements outlined by the Los Angeles County Fire Department (LACFD) in a letter to CHT dated August 6, 1996.

Site background information, results of previous (Phase 1) soil gas survey work (EST, May 2, 1996), rationale for Phase 2 soil gas sampling locations, and rationale for location of a soil boring were provided in the LACFD-approved "Remedial Investigation Work Plan" (Work Plan) (EST, September 27, 1996). Amendments to the Work Plan were proposed in "Remedial Investigation Work Plan Addendum" (EST, October 8, 1996) and "Addendum No. 2 to Work Plan for Site Assessment" (EST, March 26, 1997) which were subsequently approved by the LACFD.

The subsurface investigation was performed in accordance with the above-referenced work plan, the work plan addendums, and with Environmental Protection Agency (EPA)-recommended procedures for the collection, handling, and analysis of environmental samples.

2.0 SCOPE OF WORK

The scope of subsurface investigation included the following elements:

- Preparation of a Health and Safety Plan to guide the safe performance of work;
- Clearance of subsurface utilities;
- Further multi-depth soil gas survey work at an area of elevated concentrations of volatile organic compounds (VOCs) as indicated by Phase 1 soil gas survey results;
- Advancing a single soil boring to groundwater and collection of soil samples at five-foot-intervals for lithologic classification, field screening, and laboratory analyses;
- Installation of a vapor extraction well and nested soil gas sampling probes in the boring;
- State-certified laboratory analyses of soil samples for volatile organic compounds (VOCs) using EPA Method 8021;
- Sieve analysis of selected soil samples collected from the soil boring;
- Preparation of this Site Assessment Report.

3.0 PROJECT OBJECTIVES

The objectives of further subsurface investigation work were to:

- Assess the vertical extent of soil impacted by VOCs;
- Characterize subsurface lithology from grade to first-encountered groundwater;
- Assess current depth-to-groundwater;
- Evaluate the necessity of shallow soil remediation using Los Angeles Regional Water Quality Control Board (LARWQCB) criteria.

4.0 RATIONALE FOR SAMPLING LOCATIONS

Locations and depths of soil gas sampling probes installed on March 10 and 14, 1997 were based on results of prior soil sampling (Green Environmental, February 6, 1995) and on results of Phase 1 soil gas survey work (EST, May 2, 1996). The soil boring/vapor extraction well was located at an area of elevated concentrations of VOCs in soil gas as indicated by results of the Phase 2 multi-depth survey work performed on March 10 and 14, 1997. A plot plan of the CHT facility is shown in **Figure 2**.

5.0 FIELD METHODS AND PROCEDURES

Methods and procedures for soil gas survey work, subsurface utilities clearance, drilling, soil sampling, soil sample handling, soil sample field screening, soil sample chain-of-custody, and quality assurance/quality control data were provided in the previously referenced work plan (EST, September 27, 1996) and the Work Plan Addendums (EST, October 8, 1996 and March 26, 1997).

6.0 OBSERVATIONS AND RESULTS

Field measurements, observations, and laboratory analyses results for soil gas and soil samples are discussed in the following sections.

6.1 SOIL GAS ANALYSES RESULTS

Further (Phase 2) multi-depth soil gas survey work at CHT included the installation of two (2) 12-foot-deep, four (4) 15-foot-deep, four (4) 25-foot-deep, and two (2) 35-foot-deep soil gas sampling probes. The approximate locations of the soil gas probes are shown in **Figure 3**. Soil gas samples were collected from the multi-depth probes and analyzed for VOCs on-site using a mobile environmental laboratory. Analyses results for soil gas samples are summarized in **Table 1**. Laboratory analyses reports and quality assurance/quality control (QA/QC) data are provide in **Appendix A**.

Concentrations of chlorinated and aromatic VOCs were detected in soil gas sampled collected at the CHT site. Chlorinated VOCs detected in soil gas samples included vinyl chloride (VC), trans-1,2-dichloroethene (t-1,2-DCE), cis-1,2-dichloroethene (c-1,2-DCE), trichloroethene (TCE), and tetrachloroethene (PCE). Aromatic VOCs detected in soil gas samples included benzene, toluene, ethylbenzene, and total xylene (BTEX). Concentrations of PCE detected during the Phase 2 soil gas survey are posted in **Figure 4**. Results of soil gas analyses are discussed below.

6.1.1 Vinyl Chloride (VC)

Concentrations of VC were detected in 6 of 12 multi-depth soil gas samples. Detected concentrations of VC in soil gas ranged from 15 micrograms per liter ($\mu\text{g/L}$) in the sample collected from Probe SG1-12 (12-feet-deep) to a maximum of 55 $\mu\text{g/L}$ in the sample collected from Probe SG11-15 (15-feet-deep).

6.1.2 Trans-1,2-Dichloroethene (t-1,2-DCE)

Concentrations of t-1,2-DCE were detected in 4 of 6 multi-depth soil gas samples. Detected concentrations of t-1,2-DCE in soil gas ranged from 3 $\mu\text{g/L}$ in the sample collected from Probe SG1-12 to a maximum of 27 $\mu\text{g/L}$ in the sample collected from Probe SG5-15 (15-feet-deep).

6.1.3 Cis-1,2-Dichloroethene (c-1,2-DCE)

Concentrations of c-1,2-DCE were detected in 10 of 12 soil gas samples. Detected concentrations of c-1,2-DCE in soil gas ranged from 10 $\mu\text{g/L}$ in the sample collected from Probe SG9-15 (15-feet-deep) to a maximum of 124 $\mu\text{g/L}$ in the sample collected from Probe SG5-15.

6.1.4 Trichloroethene (TCE)

Concentrations of TCE were detected in 10 of 12 soil gas samples. Detected concentrations of TCE in soil gas ranged from 7 $\mu\text{g/L}$ in the sample collected from Probe SG1-12 (12-feet-deep) to a maximum of 156 $\mu\text{g/L}$ in the sample collected from Probe SG5-35 (35-feet-deep).

6.1.5 Tetrachloroethene (PCE)

Concentrations of PCE were detected in 12 of 12 soil gas samples. Detected concentrations of PCE in soil gas ranged from 21 $\mu\text{g/L}$ in the sample collected from Probe SG1-12 to a maximum of 1,948 $\mu\text{g/L}$ in Probe SG5-35.

6.1.6 Benzene

Benzene was detected in soil gas samples collected from Probes SG5-35 and SG10-35 at concentrations of 91 $\mu\text{g/L}$ and 188 $\mu\text{g/L}$, respectively.

6.1.7 Toluene

Concentrations of toluene were detected in 9 of 12 soil gas samples. Detected concentrations of toluene ranged from 57 µg/L in Probe SG12-12 (12-feet-deep) to a maximum of 257 µg/L in Probe SG11-25 (25-feet-deep).

6.1.8 Ethylbenzene

Ethylbenzene was detected in the soil gas sample collected from Probe SG9-15 (15-feet-deep) at a concentration of 4 µg/L.

6.1.9 Total Xylene

Total (meta + para + ortho) xylene was detected in soil gas samples collected from Probes SG5-15 (15-feet-deep) and SG9-15 (15-feet-deep) at concentrations of 6 µg/L and 18 µg/L, respectively.

6.2 DRILLING, SOIL SAMPLING, AND INSTALLATION OF A VAPOR EXTRACTION WELL WITH NESTED SOIL GAS PROBES

Based on results of the Phase 2 soil gas survey, a single soil boring was advanced in the vicinity of the former vapor degreaser. The approximate location of the soil boring (CHT-B1) is shown (with detected Phase 2 soil gas concentrations of VOCs) in **Figure 4**. Per LACFD requirements, the location of Boring CHT-B1 was referenced to a fixed datum point. The datum point used to locate CHT-B1 was the intersection of the southern CHT property line with the curb-line of South Norwalk Boulevard. Soil boring CHT-B1 was located approximately 147 feet east of, and 118 feet north of the datum point. Details of proposed drilling and soil sampling were provided in the Work Plan (EST, September 27, 1996). Details of the proposed vapor extraction well installation with nested soil gas probes were provided in Work Plan Addendum No. 2 (EST, March 26, 1997). Construction detail of the vapor extraction well with nested probes is shown in **Figure 5**.

6.3 LITHOLOGIC CHARACTERIZATION OF SOIL

Soil samples collected from the boring were visually classified using Unified Soil Classification (USCS) criteria. USCS criteria are provided in **Appendix B**. Sieve analyses were performed on selected soil samples to verify field classifications. Laboratory reports for sieve analyses are provided in **Appendix C**. The soil boring log is provided in **Appendix D**.

The boring was advanced at a 5-inch-thick concrete-paved location inside the facility. Lithologic materials encountered from below concrete-paving material to the water table (encountered at approximately 68 feet below grade) were predominantly clayey-silts with fine-to medium-grained sands (USCS Classification SM-ML), silts (USCS Classification ML) and silty-clays with fine sands (USCS Classification ML-CL).

6.4 CHEMICAL CHARACTERIZATION OF SOIL

Soil samples were analyzed for VOCs using EPA Method 8021. Laboratory analyses results for soil samples are summarized in **Table 2**. Laboratory analyses reports and quality assurance/quality control data for soil samples are provided in **Appendix E**. A total of thirteen (13) soil samples were collected at 5-foot-intervals from soil boring CHT-B1 and analyzed for VOCs. Concentrations of PCE, TCE, c-1,2-DCE, and toluene were detected in soil samples collected from the soil boring. Results of soil sample analyses are discussed below.

6.4.1 PCE

Concentrations of PCE were detected in soil samples collected from 5- to 60-feet below grade. Detected concentrations of PCE ranged from 4.8 micrograms per kilogram ($\mu\text{g/Kg}$) in soil sample CHT-B1-50 (collected from approximately 50 feet below grade) to a maximum of 130 $\mu\text{g/Kg}$ in soil sample CHT-B1-60 (collected from approximately 60 feet below grade). PCE was not detected above the laboratory method detection limit (MDL) of 3 $\mu\text{g/Kg}$ in the soil sample collected from approximately 65 feet below grade (CHT-B1-65). Detected concentrations of PCE were variable with depth, and did not exhibit apparent increasing or decreasing trends.

6.4.2 TCE

Concentrations of TCE were detected in soil samples collected from 5- to 30-feet below grade, from 40- and 45-feet below grade, and at 60-feet below grade. Detected concentrations of TCE ranged from 3 $\mu\text{g/Kg}$ in soil sample CHT-B1-40 (collected from approximately 40 feet below grade) to a maximum of 20 $\mu\text{g/Kg}$ in soil sample CHT-B1-5 (collected from approximately 5 feet below grade). TCE was not detected above the laboratory method detection limit (MDL) of 3 $\mu\text{g/Kg}$ in soil samples collected from approximately 35-, 50-, 55-, and 65 feet below grade. Detected concentrations of TCE were variable with depth, and did not exhibit apparent increasing or decreasing trends.

6.4.3 C-1,2-DCE

C-1,2-DCE was detected in soil samples collected from approximately 30- (CHT-B1-30) and 50-feet (CHT-B1-50) below grade in the boring, at concentrations of 17 $\mu\text{g/Kg}$ and 17 $\mu\text{g/Kg}$, respectively. C-1,2-DCE was not detected above the MDL of 3 $\mu\text{g/Kg}$ in other soil samples collected from the boring.

6.4.4 Toluene

Toluene was detected in soil sample CHT-B1-60 at a concentration of 6.5 $\mu\text{g/Kg}$. Toluene was not detected above the MDL (3 $\mu\text{g/Kg}$) in other soil samples collected from the boring.

6.5 INVESTIGATION-DERIVED SOIL CUTTINGS

Soil cuttings generated by hollow-stem auger drilling were contained in five (5) steel 55-gallon drums. The soil containment drums were labeled, secured, and left on-site near the western exit of the building. Treatment or disposal of investigation-derived soil cuttings is the responsibility of CHT. EST will assist CHT in evaluating the most appropriate treatment/disposal options, if requested.

7.0 PROPOSED SOIL CLEAN-UP LEVELS

Proposed soil clean-up levels (SCLs) were calculated using the LARWQCB Attenuation Factor Method (LARWQCB, February 1996). The attenuation factor method consists of a series of equations, into which site-specific variables (including depth-to-groundwater, subsurface lithology, and the identity of the contaminant(s) are input.

Parameters used to calculate SCLs for the CHT site included depth-to-groundwater of 68 feet, silt lithology from grade to the water table, and PCE and TCE as contaminants. Proposed SCLs are presented in **Table 3**. Maximum detected values of PCE and TCE (excluding soil gas values for the northwest corner of the site due to potential off-site source) in soil and soil gas are summarized and compared to proposed SCLs in **Table 4**.

8.0 CONCLUSIONS

Soil in the vicinity of the former degreaser has been impacted primarily by PCE and TCE from grade to the water table, as indicated by analytical results for soil gas and soil samples. Concentrations of PCE and TCE detected in soil gas samples collected from approximately 5, 15, 25, and 35-feet below grade exceed proposed SCLs. Concentrations of PCE and TCE detected in soil samples collected from the boring are below proposed SCLs, with the exception of soil sample CHT-B1-60, collected from approximately 60 feet below grade.

REFERENCES

Marshack, Jon. B., September 1991. A Compilation of Water Quality Goals - A Staff Report of the California Regional Water Quality Control Board.

Environmental Support Technologies, Inc., November 20, 1995. Work Plan to Perform a Multi-Depth Soil Gas Survey - Continental Heat Treating Site - 10643 South Norwalk Boulevard, Santa Fe Springs, California.

Los Angeles Regional Water Quality Control Board, February 14, 1996. Interim Guidelines for Remediation of VOC-Impacted Sites.

Environmental Support Technologies, Inc., May 8, 1996. Multi-Depth Soil Gas Survey Report - Continental Heat Treating - 10643 South Norwalk Boulevard, Santa Fe Springs, California.

County of Los Angeles Fire Department, August 6, 1996. Letter to Continental heat Treating reviewing results of May 8, 1996 soil gas survey report and requesting further site investigation and submittal of a Remedial Investigation Work Plan.

Environmental Support Technologies, Inc., September 27, 1996. Remedial Investigation Work Plan - Continental Heat Treating Site - 10643 South Norwalk Boulevard, Santa Fe Springs, California.

Environmental Support Technologies, Inc., October 8, 1996. Remedial Investigation Work Plan Addendum - Continental Heat Treating - 10643 South Norwalk Boulevard, Santa Fe Springs, California.

County of Los Angeles Fire Department, January 15, 1997. Letter to Continental Heat Treating stating review and approval of "Remedial Investigation Work Plan" and "Remedial Investigation Work Plan Addendum".

Environmental Support Technologies, Inc., March 26, 1997. Addendum No. 2 to Work Plan for Site Assessment - Continental Heat Treating - 10643 South Norwalk Boulevard, Santa Fe Springs, California.

County of Los Angeles Fire Department, March 28, 1997. Letter to Continental Heat Treating stating receipt, review, and approval of "Addendum No. 2 to Work Plan for Site Assessment".

TABLES

TABLE 1

SUMMARY OF FIELD ANALYSES RESULTS FOR SOIL GAS SAMPLES

CONTINENTAL HEAT TREATING
10643 SOUTH NORWALK BOULEVARD
SANTA FE SPRINGS, CALIFORNIA

03/18/97

CHT SOIL GAS RESULTS

SAMPLING DATE	PROBE IDENTIFICATION	PROBE DEPTH (feet)	SAMPLING EVENTS	Chlorinated Hydrocarbons (ug/L)*					Aromatic Hydrocarbons (ug/L)*			
				VC	T-1,2-DCE	C-1,2-DCE	TCE	PCE	BENZENE	TOLUENE	EBENZ	XYLS
03/10/97	SG1-12	12	2	15	3	23	7	21	ND<1	ND<1	ND<1	ND
	SG5-15	15	5	50	27	124	105	1,151	ND<5	148	ND<5	6
	SG5-25	25	1	ND<50	ND<50	ND<50	ND<50	597	ND<50	ND<50	ND<50	ND<50
03/14/97	SG5-35	35	3	ND<25	ND<25	45	156	1,948	91	101	ND<25	ND<25
03/10/97	SG9-15	15	4	45	10	10	28	503	ND<1	214	4	18
	SG9-25	25	1	ND<20	ND<20	ND<20	ND<20	213	ND<20	123	ND<20	ND<20
	SG10-15	15	2	25	ND<10	24	33	118	ND<10	ND<10	ND<10	ND<10
	SG10-25	25	2	29	24	82	116	533	ND<5	87	ND<5	ND<5
03/14/97	SG10-35	35	3	ND<10	ND<10	26	103	1,172	188	144	ND<10	ND<10
03/10/97	SG11-15	15	1	55	ND<20	48	92	445	ND<20	208	ND<20	ND<20
	SG11-25	25	1	ND<20	ND<20	26	44	368	ND<20	257	ND<20	ND<20
	SG12-12	12	1	ND<10	ND<10	31	23	284	ND<10	57	ND<10	ND<10

* = Reported analyte concentrations are the highest detected in each probe within calibration range

ND = not detected above stated laboratory method detection limit (MDL)

(ug/L) = micrograms of compound per liter of soil gas

PCE = tetrachloroethene; synonym: perchloroethylene

XYLS = total (meta+para+ortho) xylene

T-1,2-DCE = trans-1,2-dichloroethene

C-1,2-DCE = cis-1,2-dichloroethene

EBENZ = ethylbenzene

TCE = trichloroethene

VC = vinyl chloride

TABLE 2

SUMMARY OF LABORATORY ANALYSES RESULTS FOR SOIL SAMPLES

CONTINENTAL HEAT TREATING
10643 SOUTH NORWALK BOULEVARD
SANTA FE SPRINGS, CALIFORNIA

04/09/97

CHT SOIL RESULTS

SAMPLE DATE	SAMPLE IDENTIFICATION	SAMPLE DEPTH (feet)	Detected EPA Method 8021 Analytes (ug/Kg)			
			Tetrachloroethene	Trichloroethene	c-1,2-DCE	Toluene
03/27/97	CHT-B1-5	5	40	20	ND<3	ND<3
	CHT-B1-10	10	31	9.6	ND<3	ND<3
	CHT-B1-15	15	110	17	ND<3	ND<3
	CHT-B1-20	20	42	14	ND<3	ND<3
	CHT-B1-25	25	29	7	ND<3	ND<3
	CHT-B1-30	30	50	9.4	17	ND<3
	CHT-B1-35	35	8.4	ND<3	ND<3	ND<3
	CHT-B1-40	40	16	3	ND<3	ND<3
	CHT-B1-45	45	27	4	ND<3	ND<3
	CHT-B1-50	50	4.8	ND<3	17	ND<3
	CHT-B1-55	55	5.2	ND<3	ND<3	ND<3
	CHT-B1-60	60	130	7.7	ND<3	6.5
	CHT-B1-65	65	ND<3	ND<3	ND<3	ND<3

(ug/Kg) = micrograms of compound per kilogram of soil

c-1,2-DCE = cis-1,2-dichloroethene

ND = not detected above stated laboratory method detection limit

TABLE 3

**PROPOSED SOIL CLEAN-UP GOALS FOR PCE AND TCE BASED ON
LARWQCB ATTENUATION FACTOR METHOD**

(Source: "Interim Guidelines for Remediation of VOC-Impacted Sites", LARWQCB, February 14, 1996)

INPUT PARAMETERS:

DTW (feet) = Approximately 68-feet below grade.

LITHOLOGY = Silt from grade to water table.

VOC(s) = Trichloroethene (TCE) and Tetrachloroethene (PCE).

GHT SCL TABLE

VOC		TRICHLOROETHENE (AF = 145)				TETRACHLOROETHENE (AF = 729)			
BGS (feet)	D =	AF(d) =	AF(t) =	MCL (ppb) =	SCL (ppb) =	AF(d) =	AF(t) =	MCL (ppb)	SCL (ppb) =
5	63	41.79	8.32	5	42	210.1	41.96	5	209
10	58	35.85	7.19	5	36	180.3	36.19	5	181
15	53	29.92	5.94	5	30	150.4	30.10	5	150
20	48	23.99	4.80	5	24	120.6	24.10	5	121
25	43	18.10	3.61	5	18	90.80	18.15	5	91
30	38	13.83	2.74	5	14	69.31	13.83	5	69
35	33	12.14	2.44	5	12	60.31	12.01	5	60
40	28	10.45	2.10	5	11	51.33	10.25	5	51
45	23	8.76	1.75	5	9	42.34	8.46	5	42
50	18	7.10	1.40	5	7	33.36	6.66	5	33
55	13	5.39	1.07	5	5	24.37	4.86	5	24
60	8	3.70	1.0 (Note 1)	5	5	15.38	3.10	5	16
65	3	2.01	1.0 (Note 1)	5	5	6.39	1.28	5	6

BGS = depth below ground surface

D = depth to groundwater below depth of interest

AF = compound attenuation factor (From LARWQCB Table 1)

LARWQCB = Los Angeles Regional Water Quality Control Board

Note 1: AF(d) and AF(t) values must be greater than 1 by definition.

AF(d) = AF modified for depth-to-groundwater.

AF(t) = AF(d) modified based on site lithology.

MCL = maximum contaminant level (for drinking water).

(ppb) = parts per billion

SCL = proposed soil clean-up level

TABLE 4

**COMPARISON OF MAXIMUM DETECTED VALUES OF PCE AND TCE
IN SOIL AND SOIL GAS WITH PROPOSED SOIL CLEAN-UP GOALS**

CHT COMPARISON TABLE

VOC	<i>Tetrachloroethene (PCE)</i>			<i>Trichloroethene (TCE)</i>		
BGS (feet)	Soil (ug/Kg)	Soil gas (ug/L)	SCL (ppb)	Soil (ug/Kg)	Soil gas (ug/L)	SCL (ppb)
0.5	7,514 (1)	----	NC	4,759 (1)	----	NC
5	40 (5)	240 (2)	209	20 (5)	246 (2)	42
10	31 (5)	----	181	9.6 (5)	----	36
15	110 (5)	1,151 (3)	150	17 (5)	105 (3)	30
20	42 (5)	----	121	14 (5)	----	24
25	29 (5)	597 (3)	91	7 (5)	116 (3)	18
30	50 (5)	----	69	9.4 (5)	----	14
35	8.4 (5)	1,948 (4)	60	ND<3 (5)	156 (4)	12
40	16 (5)	----	51	3 (5)	----	11
45	27 (5)	----	42	3 (5)	----	9
50	4.8 (5)	----	33	ND<3 (5)	----	7
55	5.2 (5)	----	24	ND<3 (5)	----	5
60	130 (5)	----	16	7.7 (5)	----	5
65	ND<3 (5)	----	6	ND<3 (5)	----	5

BGS = depth below ground surface

NC = not calculated

(ug/Kg) = micrograms of compound per kilogram of soil

(ug/L) = micrograms of compound per liter of soil gas

(ppb) = parts per billion

---- = not applicable

SCL = soil clean-up level (proposed)

(1) Green Environmental, 02/06/95

(2) Environmental Support Technologies, 05/02/96

(3) Environmental Support Technologies, 03/10/97

(4) Environmental Support Technologies, 03/14/97

(5) Environmental Support Technologies, 03/27/97

FIGURES

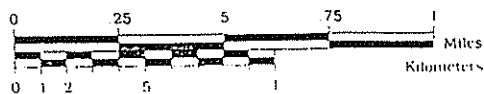
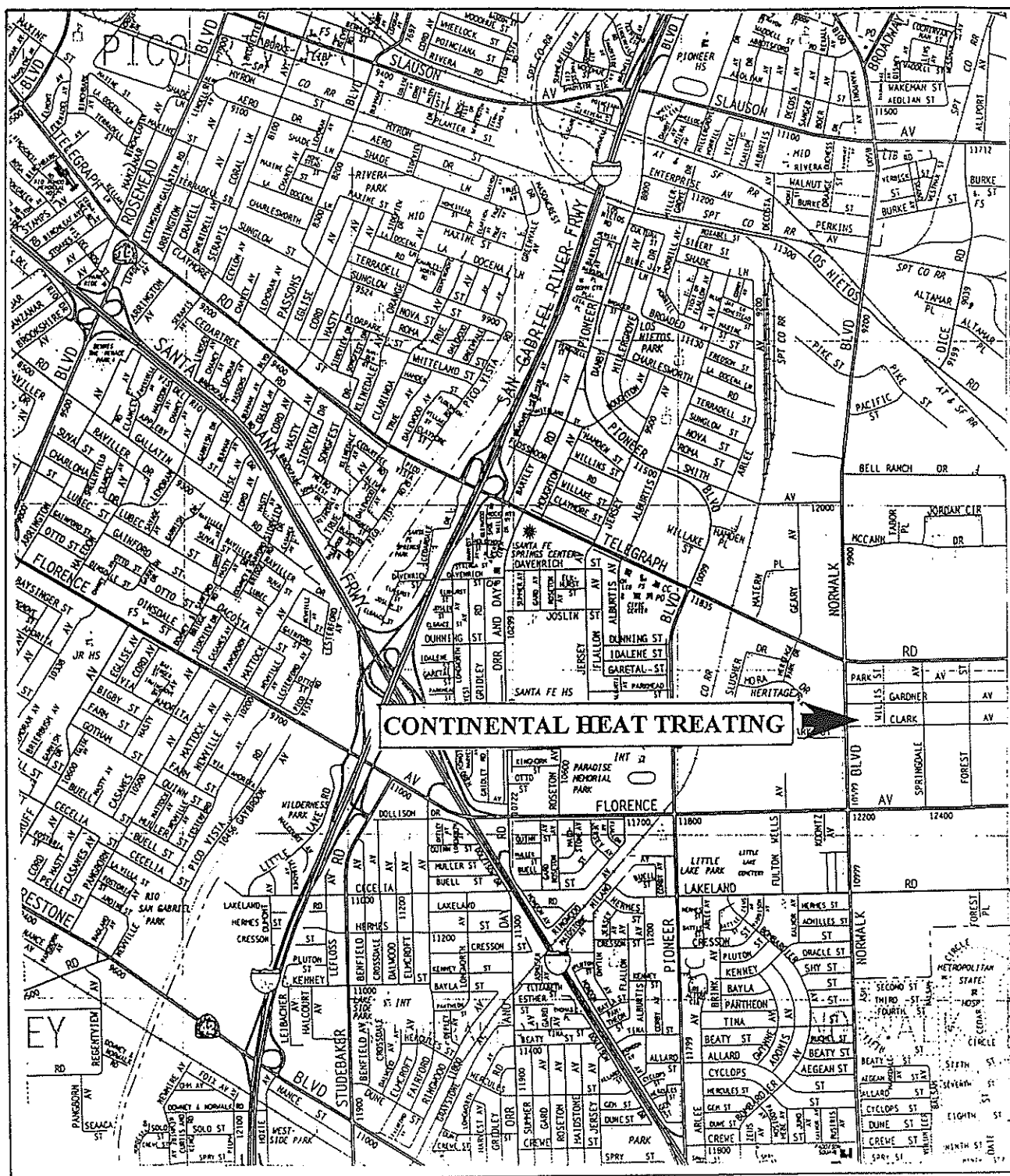
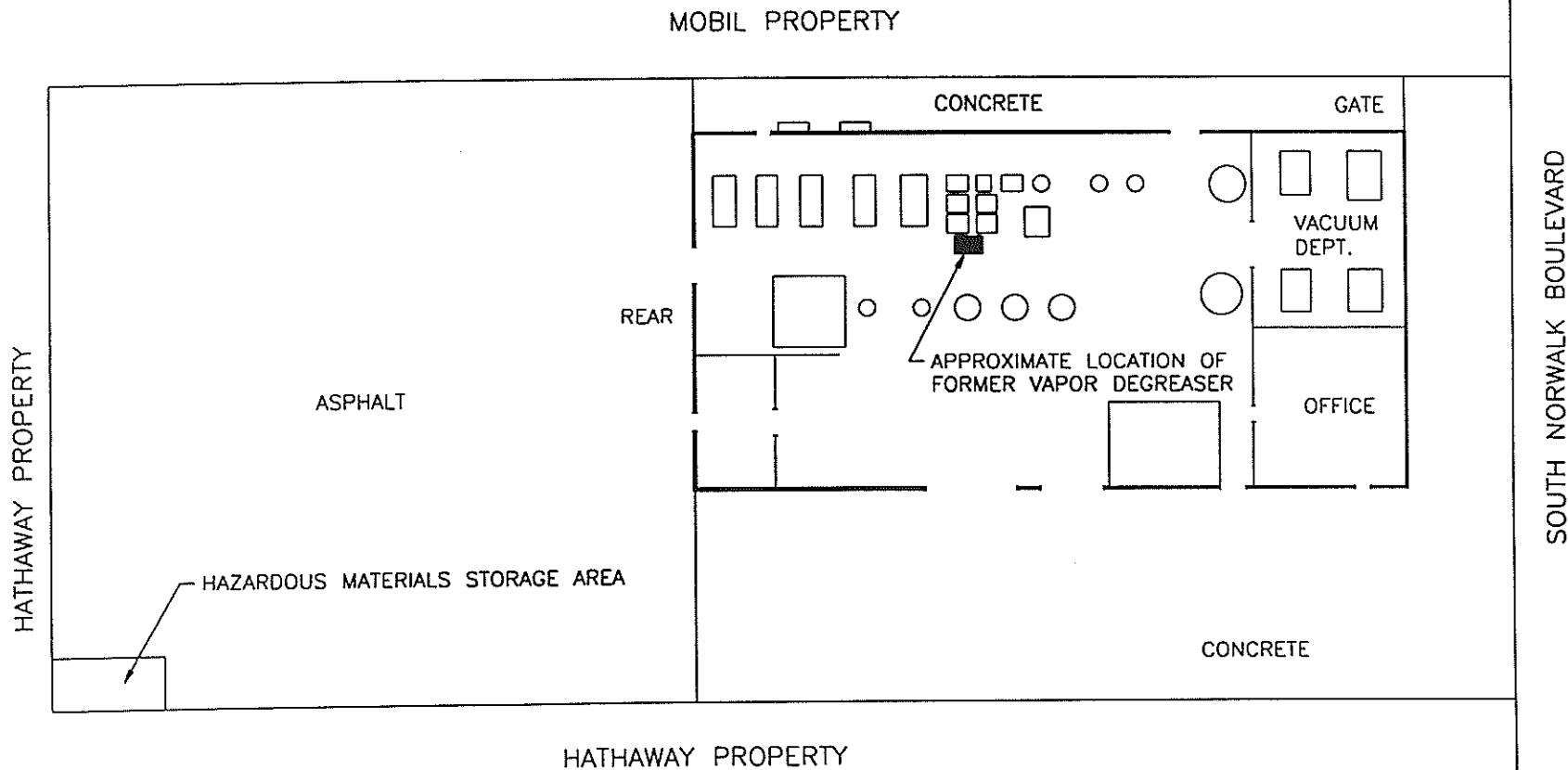


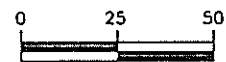
FIGURE 1
SITE LOCATION MAP
CONTINENTAL HEAT TREATING
SITE ASSESSMENT REPORT
EST1315

Source of Map: Thomas Bros., L.A. County, 1992



EXPLANATION

- FURNACES
- FURNACES

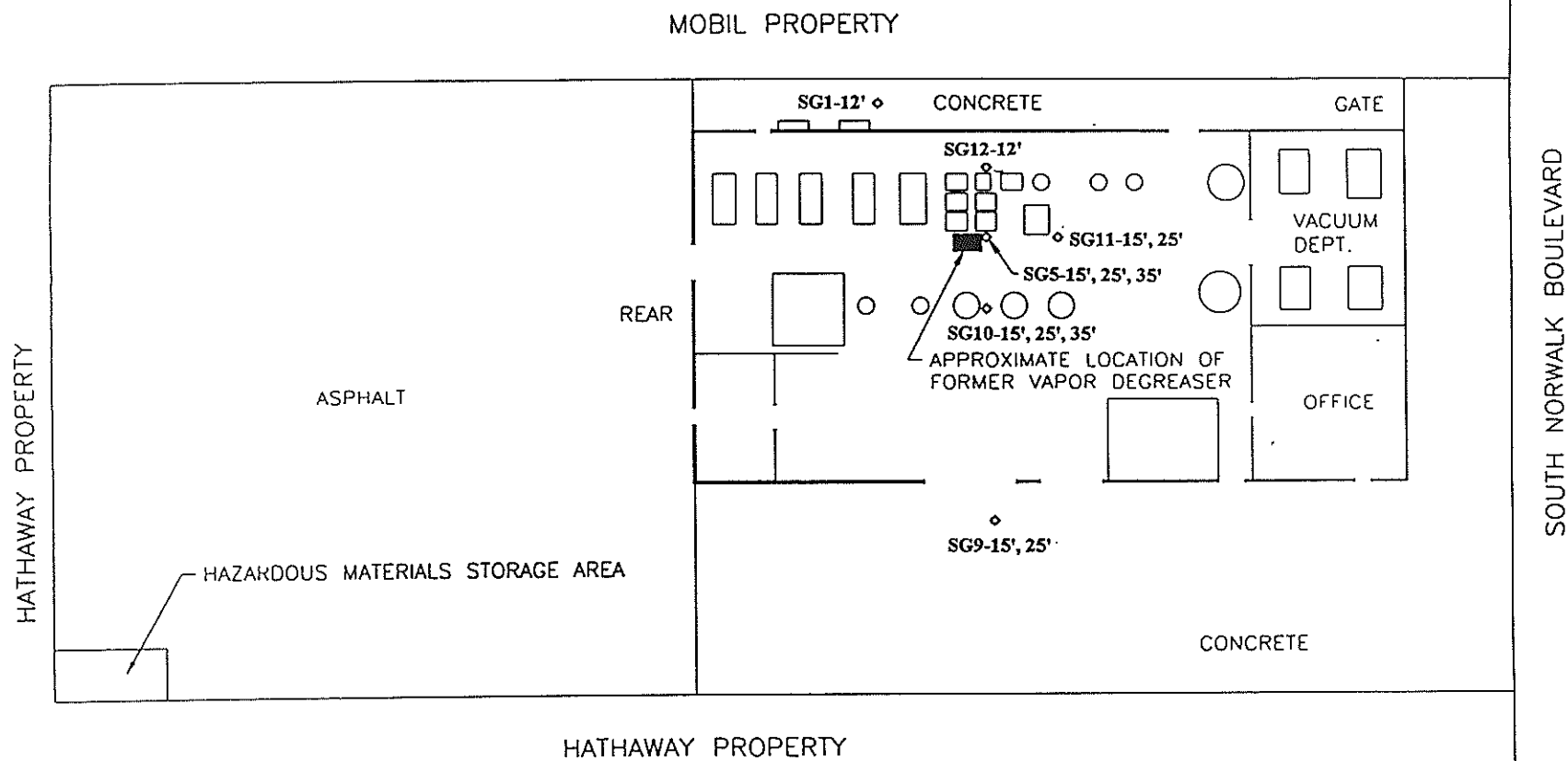


APPROXIMATE SCALE IN FEET

FIGURE 2

SITE MAP

CONTINENTAL HEAT TREATING, INC.
 10643 SOUTH NORWALK BOULEVARD
 SANTA FE SPRINGS, CALIFORNIA
 EST1315 / REMEDIAL INVESTIGATION WORK PLAN
 DRAWN BY: JST SCALE: AS SHOWN DATE: 9-27-1996



0 25 50
 APPROXIMATE SCALE IN FEET



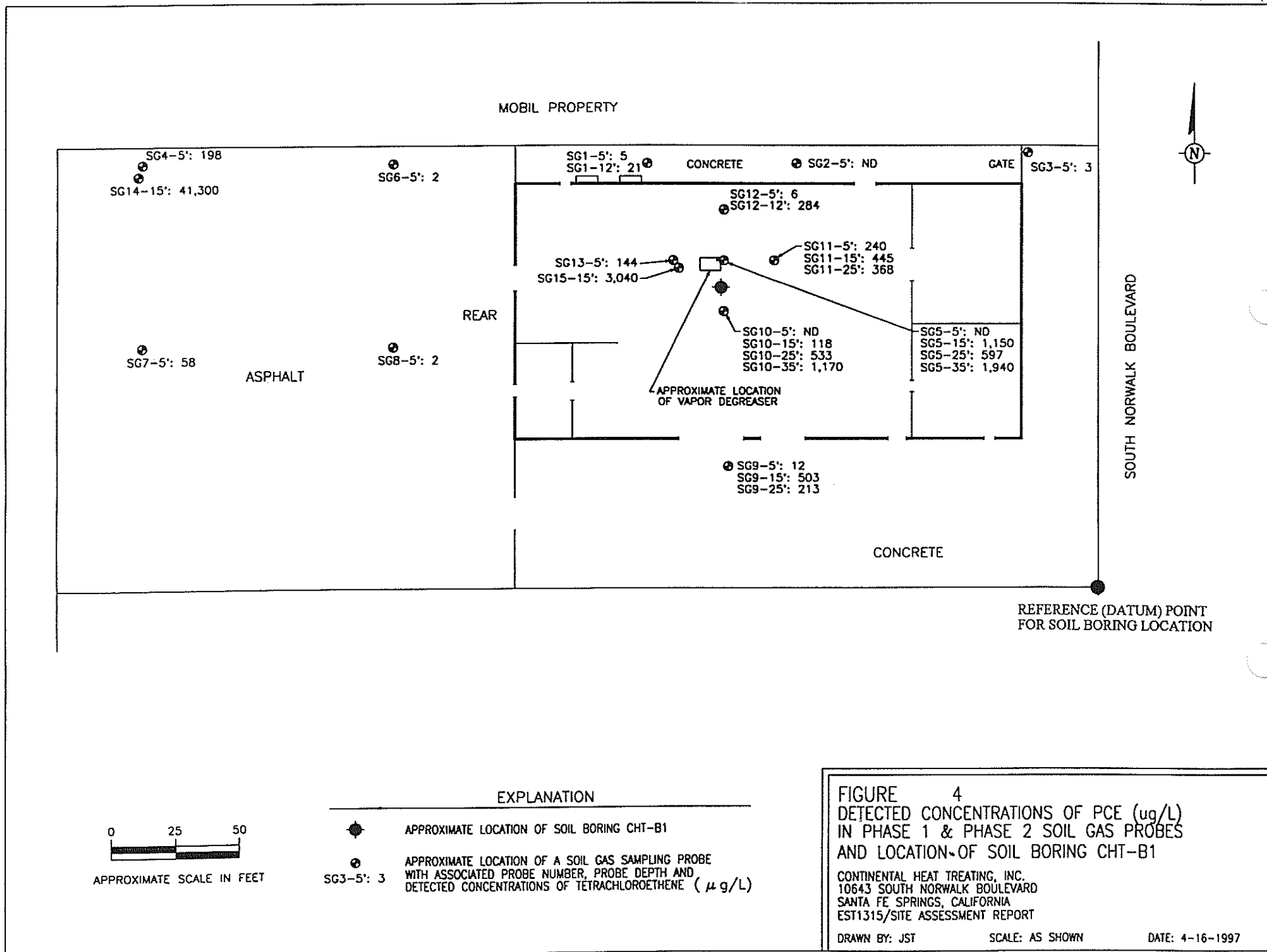
FIGURE 3
 APPROXIMATE LOCATIONS OF PHASE 2
 SOIL GAS SAMPLING PROBES

CONTINENTAL HEAT TREATING, INC.
 10643 SOUTH NORWALK BOULEVARD
 SANTA FE SPRINGS, CALIFORNIA
 EST1315

DRAWN BY: JST

SCALE: AS SHOWN

DATE: 4-16-97



TRAFFIC-RATED STEEL WELL-COVER

EXISTING CLUSTERED PROBE INSTALLATION
(APPROX. 4 FEET AWAY)

GRADE

5'

10'

15'

20'

25'

30'

35'

40'

45'

50'

55'

60'

65'

5'

15'

25'

35'



CONCRETE



HYDRATED BENTONITE



#3 SAND

SAMPLE TUBING (0.25" O.D.)

SOIL GAS SAMPLING PROBES

TOTAL DEPTH OF BORING
APPROX. 68' BELOW GRADE

EXPLANATION

1. BORE-HOLE DIAMETER EXAGGERATED FOR CLARITY
2. VERTICAL SCALE: 1 INCH = 10 FEET

FIGURE 5

CONSTRUCTION DETAIL OF
VAPOR WELL WITH NESTED SOIL GAS PROBES

EST1315 /CONTINENTAL HEAT TREATING
DRAWN BY: JST SCALE: NOT TO SCALE DATE: 4-4-1997

APPENDICES

APPENDIX A

**LABORATORY ANALYSES REPORTS AND
QA/QC DATA FOR SOIL GAS SAMPLES**

TABLE B-1

**HALOGENATED AND AROMATIC HYDROCARBONS
FIELD ANALYSES RESULTS FOR SOIL GAS SAMPLES
SITE LOCATED AT 10643 SOUTH NORWALK BOULEVARD, SANTA FE SPRINGS, CALIFORNIA
25-TARGET COMPOUND LIST**

PID/ELCD #2 - 3/10/97

FILE: 13158SGRR

SAMPLE ID	SG9-15	SG9-15	SG9-15	SG9-15	SG11-15	SG5-15	SG5-15	SG5-15
DATE	3/10/97	3/10/97	3/10/97	3/10/97	3/10/97	3/10/97	3/10/97	3/10/97
TIME	9:32	9:56	10:15	10:34	10:59	11:21	11:43	12:03
INJECTION VOLUME (μl)	500	25	25	25	25	100	20	5
PURGE VOLUME (ml)	200	200	400	800	400	400	400	400
VACUUM (in. Hg)	ND	ND	ND	ND	ND	ND	ND	ND
DILUTION FACTOR	1	20	20	20	20	5	25	100
REPORTABLE LIMIT (μg/L)	1	20	20	20	20	5	25	100
COMMENTS	RT	ARF						Syringe leak
Dichlorodifluoromethane	5:00	1.85E+05	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND
Vinyl chloride	5:27	3.55E+05	7.95E+02 4	3.98E+02 45	3.11E+02 35	3.17E+02 36	4.88E+02 55	1.48E+03 41
Chloroethane	5:78	1.16E+05	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND
Trichlorofluoromethane	6:08	6.82E+05	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND
1,1,2-Trichloro-trifluoroethane	6:50	3.72E+05	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND
1,1-Dichloroethene	6:80	6.26E+05	1.29E+02 ND<1	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	5.10E+01 ND<5	0.00E+00 ND
Methylene chloride	7:27	6.85E+05	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	5.00E+01 ND<20	0.00E+00 ND
trans-1,2-Dichloroethene	7:58	5.65E+05	2.79E+03 10	6.40E+01 ND<20	8.70E+01 ND<20	6.10E+01 ND<20	0.00E+00 ND<20	1.53E+03 27
1,1-Dichloroethane	8:02	8.11E+05	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	6.80E+01 ND<20	0.00E+00 ND
cis-1,2-Dichloroethene	8:68	8.18E+05	4.04E+03 10	1.28E+02 ND<20	1.32E+02 ND<20	9.60E+01 ND<20	9.90E+02 48	1.01E+04 124
Chloroform	8:87	1.14E+06	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND
1,1,1-Trichloroethane	9:35	9.03E+05	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND
Carbon tetrachloride	9:80	8.33E+05	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND
Benzene	9:88	3.03E+04	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND
1,2-Dichloroethane	9:90	1.91E+06	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND
Fluorobenzene (Surrogate)	10:03	1.70E+04	1.72E+02 202%	7.90E+01 93%	7.90E+01 93%	7.50E+01 88%	7.40E+01 87%	7.40E+01 87%
Trichloroethene	10:60	8.23E+05	1.75E+04 38	4.97E+02 22	6.47E+02 28	3.90E+02 ND<20	2.12E+03 92	1.41E+04 152
cis-1,3-Dichloropropene (Surrogate)	11:82	6.54E+05	3.22E+03 99%	3.14E+03 96%	3.27E+03 100%	3.07E+03 94%	2.97E+03 91%	3.01E+03 92%
Toluene	12:38	2.77E+04	5.51E+03 398	1.23E+02 178	1.48E+02 214	1.06E+02 153	1.44E+02 208	3.59E+02 130
1,1,2-Trichloroethane	12:85	8.98E+05	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND
Tetrachloroethene	13:43	8.24E+05	7.29E+04 158	9.59E+03 415	1.16E+04 503	7.12E+03 308	1.03E+04 445	5.65E+04 611
1,1,1,2-Tetrachloroethane	14:80	9.51E+05	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND
Ethylbenzene	14:77	2.33E+04	4.40E+01 4	0.00E+00 ND<20	0.00E+00 ND<20	0.00E+00 ND<20	0.00E+00 ND<20	0.00E+00 ND<5
meta and para-Xylene	14:88	6.61E+04	4.08E+02 12	0.00E+00 ND<20	0.00E+00 ND<20	0.00E+00 ND<20	0.00E+00 ND<20	4.10E+01 6
ortho-Xylene	15:68	2.29E+04	7.20E+01 6	0.00E+00 ND<20	0.00E+00 ND<20	0.00E+00 ND<20	0.00E+00 ND<20	0.00E+00 ND<5
1,1,2,2-Tetrachloroethane	16:57	8.70E+05	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND

Concentrations reported in micrograms per liter (μg/L)

ND = Not detected

ND< = Not detected above the reported limit of quantitation

RT = Retention time

μl = Microliter

ml = Milliliter

in. Hg = Inches of mercury

ARF = Average response factor

* = Exceeds quantitation range

NA = Not Analyzed

3/10/97

TABLE B-1
HALOGENATED AND AROMATIC HYDROCARBONS
FIELD ANALYSES RESULTS FOR SOIL GAS SAMPLES
SITE LOCATED AT 10643 SOUTH NORWALK BOULEVARD, SANTA FE SPRINGS, CALIFORNIA
25-TARGET COMPOUND LIST

PID/ELCD #2 - 3/10/97

FILE: 1315BSGRP

SAMPLE ID	SG5-15	SG5-15	SG10-15	SG10-15	SG12-12	SG1-12	SG1-12	SG5-25
DATE	3/10/97	3/10/97	3/10/97	3/10/97	3/10/97	3/10/97	3/10/97	3/10/97
TIME	12:24	12:42	13:04	13:21	13:44	14:09	14:26	14:49
INJECTION VOLUME (µl)	10	5	20	50	50	500	100	10
PURGE VOLUME (ml)	400	400	400	400	370	370	370	500
VACUUM (in. Hg)	ND	ND	ND	ND	ND	11	11	ND
DILUTION FACTOR	50	100	25	10	10	1	5	50
REPORTABLE LIMIT (µg/L)	50	100	25	10	10	1	5	50
COMMENTS	RT	ARF						
Dichlorodifluoromethane	5:00	1.85E+05	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND
Vinyl chloride	5:27	3.55E+05	0.00E+00 ND<50	0.00E+00 ND<100	0.00E+00 ND<25	0.00E+00 25	0.00E+00 ND<10	0.00E+00 6
Chloroethane	5:78	1.16E+05	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND
Trichlorofluoromethane	6:08	6.82E+05	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND
1,1,2-Trichloro-trifluoroethane	6:50	3.72E+05	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND
1,1-Dichloroethane	6:80	6.26E+05	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND
Methylene chloride	7:27	6.85E+05	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND
trans-1,2-Dichloroethane	7:58	5.65E+05	9.80E+01 ND<50	5.10E+01 ND<100	0.00E+00 ND<25	1.24E+02 ND<10	1.98E+02 ND<10	7.82E+02 3
1,1-Dichloroethane	8:02	8.11E+05	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND
cis-1,2-Dichloroethane	8:68	8.18E+05	6.92E+02 85	3.25E+02 ND<100	3.69E+02 ND<25	9.89E+02 24	1.28E+03 31	6.54E+03 16
Chloroform	8:87	1.14E+06	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND
1,1,1-Trichloroethane	9:35	9.03E+05	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND
Carbon tetrachloride	9:80	8.33E+05	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND
Benzene	9:88	3.03E+04	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND
1,2-Dichloroethane	9:90	1.91E+06	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND
Fluorobenzene (Surrogate)	10:03	1.70E+04	7.90E+01 93%	7.80E+01 92%	8.20E+01 96%	7.60E+01 89%	6.50E+01 76%	8.10E+01 95%
Trichloroethane	10:60	9.23E+05	9.70E+02 105	3.97E+02 ND<100	4.66E+02 25	1.50E+03 33	1.06E+03 23	2.94E+03 6
cis-1,3-Dichloropropene (Surrogate)	11:82	6.54E+05	3.07E+03 94%	3.09E+03 95%	3.22E+03 99%	3.21E+03 98%	2.83E+03 86%	3.36E+03 103%
Toluene	12:38	2.77E+04	4.10E+01 148	0.00E+00 ND<100	0.00E+00 ND<25	0.00E+00 ND<10	7.90E+01 57	0.00E+00 ND<1
1,1,2-Trichloroethane	12:85	8.98E+05	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND
Tetrachloroethane	13:43	9.24E+05	1.63E+04 1,760	5.32E+03 1,150	1.81E+03 98	5.44E+03 118	1.31E+04 284	1.44E+04 31
1,1,1,2-Tetrachloroethane	14:80	9.51E+05	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND
Ethylbenzene	14:77	2.33E+04	0.00E+00 ND<50	0.00E+00 ND<100	0.00E+00 ND<25	0.00E+00 ND<10	0.00E+00 ND<10	0.00E+00 ND<5
meta and para-Xylene	14:88	6.61E+04	0.00E+00 ND<50	0.00E+00 ND<100	0.00E+00 ND<25	0.00E+00 ND<10	0.00E+00 ND<10	0.00E+00 ND<5
ortho-Xylene	15:68	2.29E+04	0.00E+00 ND<50	0.00E+00 ND<100	0.00E+00 ND<25	0.00E+00 ND<10	0.00E+00 ND<10	0.00E+00 ND<5
1,1,2,2-Tetrachloroethane	16:57	8.70E+05	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND

Concentrations reported in micrograms per liter (µg/L)
 ND = not detected
 ND< = not detected above the reported limit of quantitation
 RT = retention time

µl = microliter
 ml = milliliter
 in. Hg = inches of mercury

ARF = average response factor
 * = exceeds quantitation range
 NA = Not Analyzed

3/10/97

TABLE B-1
HALOGENATED AND AROMATIC HYDROCARBONS
FIELD ANALYSES RESULTS FOR SOIL GAS SAMPLES
SITE LOCATED AT 10643 SOUTH NORWALK BOULEVARD, SANTA FE SPRINGS, CALIFORNIA
25-TARGET COMPOUND LIST

PID/ELCD #2 - 3/14/97

FILE: J315CSGRP

SAMPLE ID	SG10-35	SG10-35	SG10-35	SG5-35	SG5-35	SG5-35	NA	NA
DATE	3/14/97	3/14/97	3/14/97	3/14/97	3/14/97	3/14/97	NA	NA
TIME	13:23	13:48	14:07	14:37	15:02	15:25	NA	NA
INJECTION VOLUME (µl)	50	10	10	20	500	500	NA	NA
PURGE VOLUME (ml)	600	600	600	600	600	600	NA	NA
VACUUM (in. Hg)	ND	ND	ND	ND	ND	ND	NA	NA
DILUTION FACTOR	10	50	50	25	80	80	NA	NA
REPORTABLE LIMIT (µg/L)	10	50	50	25	80	80	NA	NA
COMMENTS	RT	ARF	Syringe Leak ?		Dilution 1 : 80	Dilution Duplicate		
Dichlorodifluoromethane	5:00	1.85E+05	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	NA NA
Vinyl chloride	5:27	3.55E+05	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	NA NA
Chloroethane	5:78	1.16E+05	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	NA NA
Trichlorofluoromethane	6:08	6.82E+05	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	NA NA
1,1,2-Trichloro-trifluoroethane	6:50	3.72E+05	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	NA NA
1,1-Dichloroethene	6:80	6.26E+05	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	NA NA
Methylene chloride	7:27	6.85E+05	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	NA NA
trans-1,2-Dichloroethene	7:58	5.65E+05	0.00E+00 ND	0.00E+00 ND	5.20E+01 ND<50	1.37E+02 ND<25	0.00E+00 ND	0.00E+00 ND
1,1-Dichloroethane	8:02	8.11E+05	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	NA NA
cis-1,2-Dichloroethane	8:68	8.18E+05	1.08E+03 26	0.00E+00 ND<50	2.77E+02 ND<50	7.39E+02 45	1.96E+02 ND<80	1.97E+02 ND<80
Chloroform	8:87	1.14E+06	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND
1,1,1-Trichloroethane	9:35	9.03E+05	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND
Carbon tetrachloride	9:80	8.33E+05	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND
Benzene	9:88	3.03E+04	1.53E+02 101	0.00E+00 ND<50	5.70E+01 188	5.50E+01 91	0.00E+00 ND<80	0.00E+00 ND<80
1,2-Dichloroethane	9:90	1.91E+06	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND
Fluorobenzene (Surrogate)	10:03	1.70E+04	7.00E+01 82%	9.60E+01 113%	9.40E+01 111%	8.40E+01 99%	8.40E+01 99%	8.00E+01 94%
Trichloroethane	10:60	9.23E+05	3.55E+03 77	0.00E+00 ND<50	9.53E+02 103	2.87E+03 155	8.21E+02 142	8.98E+02 156
cis-1,3-Dichloropropene (Surrogate)	11:82	6.54E+05	3.01E+03 92%	2.88E+03 88%	3.67E+03 112%	3.12E+03 95%	3.30E+03 101%	3.13E+03 96%
Toluene	12:38	2.77E+04	1.55E+02 112	0.00E+00 ND<50	4.00E+01 144	5.60E+01 101	0.00E+00 ND<80	0.00E+00 ND<80
1,1,2-Trichloroethane	12:85	8.98E+05	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND
Tetrachloroethene	13:43	9.24E+05	4.37E+04 945	1.87E+03 202	1.08E+04 1,170	3.80E+04 2,060	1.12E+04 1,950	1.01E+04 1,750
1,1,1,2-Tetrachloroethane	14:80	9.51E+05	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND
Ethylbenzene	14:77	2.33E+04	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND
meta and para-Xylene	14:88	6.61E+04	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND
ortho-Xylene	15:68	2.29E+04	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND
1,1,2,2-Tetrachloroethane	16:57	8.70E+05	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND

Concentrations reported in micrograms per liter (µg/L)

ND = Not detected

ND< = Not detected above the reported limit of quantitation

RT = Retention time

µl = Microliter

ml = Milliliter

in. Hg = Inches of mercury

ARF = Average response factor

* = Exceeds quantitation range

NA = Not Analyzed

3/14/97

(RA)

TABLE B-1

**HALOGENATED AND AROMATIC HYDROCARBONS
FIELD ANALYSES RESULTS FOR SOIL GAS SAMPLES
SITE LOCATED AT 10643 SOUTH NORWALK BOULEVARD, SANTA FE SPRINGS, CALIFORNIA
25-TARGET COMPOUND LIST**

PID/ELCD #2-3/10/97

FILE: 1315BSGRP

SAMPLE ID	SG10-25	SG10-25	SG11-25	SG9-25	NA	NA	NA	NA
DATE	3/10/97	3/10/97	3/10/97	3/10/97	NA	NA	NA	NA
TIME	15:09	15:27	15:44	16:03	NA	NA	NA	NA
INJECTION VOLUME (µl)	100	20	25	25	NA	NA	NA	NA
PURGE VOLUME (ml)	500	500	500	500	NA	NA	NA	NA
VACUUM (in. Hg)	ND	ND	ND	ND	NA	NA	NA	NA
DILUTION FACTOR	5	25	20	20	NA	NA	NA	NA
REPORTABLE LIMIT (µg/L)	5	25	20	20	NA	NA	NA	NA
COMMENTS	RT	ARF						
Dichlorodifluoromethane	5:00	1.85E+05	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	NA	NA
Vinyl chloride	5:27	3.55E+05	1.02E+03 29	0.00E+00 ND<25	0.00E+00 ND<20	0.00E+00 ND<20	NA	NA
Chloroethane	5:78	1.16E+05	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	NA	NA
Trichlorofluoromethane	6:08	6.82E+05	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	NA	NA
1,1,2-Trichloro-trifluoroethane	6:50	3.72E+05	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	NA	NA
1,1-Dichloroethene	6:80	6.26E+05	5.60E+01 ND<5	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	NA	NA
Methylene chloride	7:27	6.85E+05	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	NA	NA
trans-1,2-Dichloroethene	7:58	5.65E+05	1.38E+03 24	1.12E+02 ND<25	0.00E+00 ND<20	0.00E+00 ND<20	NA	NA
1,1-Dichloroethane	8:02	8.11E+05	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	NA	NA
cis-1,2-Dichloroethene	8:68	8.18E+05	6.69E+03 82	6.04E+02 37	5.36E+02 26	0.00E+00 ND<20	NA	NA
Chloroform	8:87	1.14E+06	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	NA	NA
1,1,1-Trichloroethane	9:35	9.03E+05	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	NA	NA
Carbon tetrachloride	9:80	8.33E+05	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	NA	NA
Benzene	9:88	3.03E+04	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	NA	NA
1,2-Dichloroethane	9:90	1.91E+06	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	NA	NA
Fluorobenzene (Surrogate)	10:03	1.70E+04	6.90E+01 81%	8.20E+01 96%	6.30E+01 74%	7.30E+01 86%	NA	NA
Trichloroethene	10:60	9.23E+05	1.07E+04 116	8.45E+02 46	1.01E+03 44	2.08E+02 ND<20	NA	NA
cis-1,3-Dichloropropene (Surrogate)	11:82	6.54E+05	3.39E+03 104%	3.77E+03 115%	3.05E+03 93%	3.20E+03 98%	NA	NA
Toluene	12:38	2.77E+04	5.62E+02 203	4.80E+01 87	1.78E+02 257	8.50E+01 123	NA	NA
1,1,2-Trichloroethane	12:85	8.98E+05	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	NA	NA
Tetrachloroethene	13:43	9.24E+05	5.03E+04 545	9.84E+03 533	8.49E+03 368	4.93E+03 213	NA	NA
1,1,1,2-Tetrachloroethane	14:80	9.51E+05	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	NA	NA
Ethylbenzene	14:77	2.33E+04	0.00E+00 ND<5	0.00E+00 ND<25	0.00E+00 ND<20	0.00E+00 ND<20	NA	NA
meta and para-Xylene	14:88	6.61E+04	0.00E+00 ND<5	0.00E+00 ND<25	0.00E+00 ND<20	0.00E+00 ND<20	NA	NA
ortho-Xylene	15:68	2.29E+04	0.00E+00 ND<5	0.00E+00 ND<25	0.00E+00 ND<20	0.00E+00 ND<20	NA	NA
1,1,2,2-Tetrachloroethane	16:57	8.70E+05	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	NA	NA

Concentrations reported in micrograms per liter (µg/L)

ND = not detected

ND< = not detected above the reported limit of quantitation

RT = retention time

µl = microliter

ml = milliliter

in. Hg = inches of mercury

ARF = average response factor

* = exceeds quantitation range

NA = Not Analyzed

3/10/97

TABLE B-2
QUALITY ASSURANCE/QUALITY CONTROL REPORT
SUBJECT SITE, CALIFORNIA

3/10/97

FILE: 1315BQAQC

TARGET COMPOUNDS		February 18, 1997							March 10, 1997					
		THREE-POINT CALIBRATION					LCS			MID-POINT			LAST RUN	
		5000	5000	5000			5000		BLANK	5000		BLANK	5000	
STANDARD CONC. (µg/L)		0.50	1.00	2.00			1.00		500	1.00		500	1.00	
INJECTION VOLUME(µL)		0.0025	0.0050	0.0100	ARF	%RSD	0.0050	RPD		0.0050	RPD		0.0050	RPD
COMPOUND/WEIGHT(µg)	RT													
Dichlorodifluoromethane	5:00	485	859	1885			997						0	
CF		1.94E+05	1.72E+05	1.89E+05	1.85E+05	6	1.99E+05	8	ND	0.00E+00	NA	ND	0.00E+00	NA
Vinyl chloride	5:27	1037	1737	3026			1665			1329			0	
CF		4.15E+05	3.47E+05	3.03E+05	3.55E+05	16	3.33E+05	-6	ND	2.66E+05	-25	ND	0.00E+00	NA
Chloroethane	5:78	380	552	858			435						0	
CF		1.52E+05	1.10E+05	8.58E+04	1.16E+05	29	8.70E+04	-25	ND	0.00E+00	NA	ND	0.00E+00	NA
Trichlorofluoromethane	6:08	1874	3417	6137			3697						0	
CF		7.50E+05	6.83E+05	6.14E+05	6.82E+05	10	7.39E+05	8	ND	0.00E+00	NA	ND	0.00E+00	NA
1,1,2-Trichloro-trifluoroethane	6:50	1009	1870	3395			2058						0	
CF		4.04E+05	3.74E+05	3.40E+05	3.72E+05	9	4.12E+05	11	ND	0.00E+00	NA	ND	0.00E+00	NA
1,1-Dichloroethene	6:80	1755	3049	5648			3357			2959			0	
CF		7.02E+05	6.10E+05	5.65E+05	6.26E+05	11	6.71E+05	7	ND	5.92E+05	-5	ND	0.00E+00	NA
Methylene chloride	7:27	1918	3366	6138			3737						0	
CF		7.67E+05	6.73E+05	6.14E+05	6.85E+05	11	7.47E+05	9	ND	0.00E+00	NA	ND	0.00E+00	NA
trans-1,2-Dichloroethene	7:58	1567	2747	5184			3129			2855			0	
CF		6.27E+05	5.49E+05	5.18E+05	5.65E+05	10	6.26E+05	11	ND	5.71E+05	1	ND	0.00E+00	NA
1,1-Dichloroethane	8:02	2272	3786	7662			4188			4207			0	
CF		9.09E+05	7.57E+05	7.66E+05	8.11E+05	10	8.38E+05	3	ND	8.41E+05	4	ND	0.00E+00	NA
cis-1,2-Dichloroethene	8:68	2307	3802	7713			4482			3961			0	
CF		9.23E+05	7.60E+05	7.71E+05	8.18E+05	11	8.96E+05	10	ND	7.92E+05	-3	ND	0.00E+00	NA
Chloroform	8:87	3177	5252	11010			6212						0	
CF		1.27E+06	1.05E+06	1.10E+06	1.14E+06	10	1.24E+06	9	ND	0.00E+00	NA	ND	0.00E+00	NA
1,1,1-Trichloroethane	9:35	2526	4163	8665			4844			4680			0	
CF		1.01E+06	8.33E+05	8.67E+05	9.03E+05	10	9.69E+05	7	ND	9.36E+05	4	ND	0.00E+00	NA
Carbon tetrachloride	9:80	2024	3980	8927			4010						0	
CF		8.10E+05	7.96E+05	8.93E+05	8.33E+05	6	8.02E+05	-4	ND	0.00E+00	NA	ND	0.00E+00	NA
Benzene (PID)	9:88	77	142	316			139			161			0	
CF		3.08E+04	2.84E+04	3.16E+04	3.03E+04	6	2.78E+04	-8	ND	3.22E+04	6	ND	0.00E+00	NA
1,2-Dichloroethane	9:90	5667	8497	17712			8163			10493			0	
CF		2.27E+06	1.70E+06	1.77E+06	1.91E+06	16	1.63E+06	-15	ND	2.10E+06	10	ND	0.00E+00	NA
Fluorobenzene (Surrogate)	10:03	40	83	184			0						0	
CF		1.60E+04	1.66E+04	1.84E+04	1.70E+04	7	0.00E+00	NA	ND	0.00E+00	NA	ND	0.00E+00	NA
Trichloroethene	10:60	2600	4242	8805			5064			4783			0	
CF		1.04E+06	8.48E+05	8.81E+05	9.23E+05	11	1.01E+06	10	ND	9.57E+05	4	ND	0.00E+00	NA
cis-1,3-Dichloropropene (Surrogate)	11:82	1540	3263	6937			0						0	
CF		6.16E+05	6.53E+05	6.94E+05	6.54E+05	6	0.00E+00	NA	ND	0.00E+00	NA	ND	0.00E+00	NA
Toluene (PID)	12:38	67	133	297			133			147			0	
CF		2.68E+04	2.66E+04	2.97E+04	2.77E+04	6	2.66E+04	-4	ND	2.94E+04	6	ND	0.00E+00	NA
1,1,2-Trichloroethane	12:85	2479	4085	8839			4778			4611			0	
CF		9.92E+05	8.17E+05	8.84E+05	8.98E+05	10	9.56E+05	6	ND	9.22E+05	3	ND	0.00E+00	NA
Tetrachloroethene	13:43	2542	4258	9022			4711			4364			0	
CF		1.02E+06	8.52E+05	9.02E+05	9.24E+05	9	9.42E+05	2	ND	8.73E+05	-5	ND	0.00E+00	NA
1,1,1,2-Tetrachloroethane	14:80	2715	4194	9296			4848						0	
CF		1.09E+06	8.39E+05	9.30E+05	9.51E+05	13	9.70E+05	2	ND	0.00E+00	NA	ND	0.00E+00	NA
Ethylbenzene (PID)	14:77	48	124	259			108						0	
CF		1.92E+04	2.48E+04	2.59E+04	2.33E+04	15	2.16E+04	-7	ND	0.00E+00	NA	ND	0.00E+00	NA
m,p-Xylene (PID)	14:88	159	317	712			329			353			0	
CF		6.36E+04	6.34E+04	7.12E+04	6.61E+04	7	6.58E+04	0	ND	7.06E+04	7	ND	0.00E+00	NA
o-Xylene (PID)	15:68	57	99	261			120			121			0	
CF		2.28E+04	1.98E+04	2.61E+04	2.29E+04	14	2.40E+04	5	ND	2.42E+04	6	ND	0.00E+00	NA
1,1,2,2-Tetrachloroethane	16:57	2329	3992	8797			4138						0	
CF		9.32E+05	7.98E+05	8.80E+05	8.70E+05	8	8.28E+05	-5	ND	0.00E+00	NA	ND	0.00E+00	NA

RT = Retention Time
 CF = Calibration Factor
 PID = Photo-ionization Detector

µg/L = Micrograms per Liter
 µL = Microliters
 µg = Microgram

ARF = Average Response Factor
 RPD = Relative Percent Difference
 LCS = Laboratory Control Sample

ND = Not Detected
 NA = Not Applicable

ANALYST: Ragi Abraham

REVIEWED BY: David M. Pride

TABLE B-2
QUALITY ASSURANCE/QUALITY CONTROL REPORT
SUBJECT SITE, CALIFORNIA

3/14/97

FILE: 1315CQA.QC

TARGET COMPOUNDS		February 18, 1997									March 14, 1997				
		THREE-POINT CALIBRATION					LCS				MID-POINT			LAST RUN	
STANDARD CONC. (µg/L)		5000	5000	5000			5000		BLANK		5000		BLANK	5000	
INJECTION VOLUME(µL)		0.60	1.00	2.00			1.00		500		1.00		500	1.00	
COMPOUND/WEIGHT(µg)	RT	0.0025	0.0050	0.0100	ARF	%RSD	0.0050	RPD			0.0050	RPD		0.0050	RPD
Dichlorodifluoromethane	5:00	485	859	1885			997							0	
CF		1.94E+05	1.72E+05	1.89E+05	1.85E+05	6	1.99E+05	8	ND		0.00E+00	NA	ND	0.00E+00	NA
Vinyl chloride	5:27	1037	1737	3026			1665				1361			0	
CF		4.15E+05	3.47E+05	3.03E+05	3.55E+05	16	3.33E+05	-6	ND		2.72E+05	-23	ND	0.00E+00	NA
Chloroethane	5:78	380	552	858			435							0	
CF		1.52E+05	1.10E+05	8.58E+04	1.16E+05	29	8.70E+04	-25	ND		0.00E+00	NA	ND	0.00E+00	NA
Trichlorofluoromethane	6:08	1874	3417	6137			3697							0	
CF		7.50E+05	6.83E+05	6.14E+05	6.82E+05	10	7.39E+05	8	ND		0.00E+00	NA	ND	0.00E+00	NA
1,1,2-Trichloro-trifluoroethane	6:50	1009	1870	3395			2058							0	
CF		4.04E+05	3.74E+05	3.40E+05	3.72E+05	9	4.12E+05	11	ND		0.00E+00	NA	ND	0.00E+00	NA
1,1-Dichloroethene	6:80	1755	3049	5648			3357				2767			0	
CF		7.02E+05	6.10E+05	5.65E+05	6.26E+05	11	6.71E+05	7	ND		5.53E+05	-12	ND	0.00E+00	NA
Methylene chloride	7:27	1918	3366	6138			3737							0	
CF		7.67E+05	6.73E+05	6.14E+05	6.85E+05	11	7.47E+05	9	ND		0.00E+00	NA	ND	0.00E+00	NA
trans-1,2-Dichloroethene	7:58	1567	2747	5184			3129				2536			0	
CF		6.27E+05	5.49E+05	5.18E+05	5.65E+05	10	6.26E+05	11	ND		5.07E+05	-10	ND	0.00E+00	NA
1,1-Dichloroethane	8:02	2272	3786	7662			4188				4054			0	
CF		9.09E+05	7.57E+05	7.66E+05	8.11E+05	10	8.38E+05	3	ND		8.11E+05	0	ND	0.00E+00	NA
cis-1,2-Dichloroethene	8:68	2307	3802	7713			4482				3761			0	
CF		9.23E+05	7.60E+05	7.71E+05	8.18E+05	11	8.96E+05	10	ND		7.52E+05	-8	ND	0.00E+00	NA
Chloroform	8:87	3177	5252	11010			6212							0	
CF		1.27E+06	1.05E+06	1.10E+06	1.14E+06	10	1.24E+06	9	ND		0.00E+00	NA	ND	0.00E+00	NA
1,1,1-Trichloroethane	9:35	2526	4163	8665			4844				4516			0	
CF		1.01E+06	8.33E+05	8.67E+05	9.03E+05	10	9.69E+05	7	ND		9.03E+05	0	ND	0.00E+00	NA
Carbon tetrachloride	9:80	2024	3980	8927			4010							0	
CF		8.10E+05	7.96E+05	8.93E+05	8.33E+05	6	8.02E+05	-4	ND		0.00E+00	NA	ND	0.00E+00	NA
Benzene (PID)	9:88	77	142	316			139				163			0	
CF		3.08E+04	2.84E+04	3.16E+04	3.03E+04	6	2.78E+04	-8	ND		3.26E+04	8	ND	0.00E+00	NA
1,2-Dichloroethane	9:90	5667	8497	17712			8163				9222			0	
CF		2.27E+06	1.70E+06	1.77E+06	1.91E+06	16	1.63E+06	-15	ND		1.84E+06	-4	ND	0.00E+00	NA
Fluorobenzene (Surrogate)	10:03	40	83	184			0							0	
CF		1.60E+04	1.66E+04	1.84E+04	1.70E+04	7	0.00E+00	NA	ND		0.00E+00	NA	ND	0.00E+00	NA
Trichloroethene	10:60	2600	4242	8805			5064				3918			0	
CF		1.04E+06	8.48E+05	8.81E+05	9.23E+05	11	1.01E+06	10	ND		7.84E+05	-15	ND	0.00E+00	NA
cis-1,3-Dichloropropene (Surrogate)	11:82	1540	3263	6937			0							0	
CF		6.16E+05	6.53E+05	6.94E+05	6.54E+05	6	0.00E+00	NA	ND		0.00E+00	NA	ND	0.00E+00	NA
Toluene (PID)	12:38	67	133	297			133				145			0	
CF		2.68E+04	2.66E+04	2.97E+04	2.77E+04	6	2.66E+04	-4	ND		2.90E+04	5	ND	0.00E+00	NA
1,1,2-Trichloroethane	12:85	2479	4085	8839			4778				3927			0	
CF		9.92E+05	8.17E+05	8.84E+05	8.98E+05	10	9.56E+05	6	ND		7.85E+05	-12	ND	0.00E+00	NA
Tetrachloroethene	13:43	2542	4258	9022			4711				4041			0	
CF		1.02E+06	8.52E+05	9.02E+05	9.24E+05	9	9.42E+05	2	ND		8.08E+05	-12	ND	0.00E+00	NA
1,1,1,2-Tetrachloroethane	14:80	2715	4194	9296			4848							0	
CF		1.09E+06	8.39E+05	9.30E+05	9.51E+05	13	9.70E+05	2	ND		0.00E+00	NA	ND	0.00E+00	NA
Ethylbenzene (PID)	14:77	48	124	259			108							0	
CF		1.92E+04	2.48E+04	2.59E+04	2.33E+04	15	2.16E+04	-7	ND		0.00E+00	NA	ND	0.00E+00	NA
m,p-Xylene (PID)	14:88	159	317	712			329				320			0	
CF		6.36E+04	6.34E+04	7.12E+04	6.61E+04	7	6.58E+04	0	ND		6.40E+04	-3	ND	0.00E+00	NA
o-Xylene (PID)	15:68	57	99	261			120				118			0	
CF		2.28E+04	1.98E+04	2.61E+04	2.29E+04	14	2.40E+04	5	ND		2.36E+04	3	ND	0.00E+00	NA
1,1,2,2-Tetrachloroethane	16:57	2329	3992	8797			4138							0	
CF		9.32E+05	7.98E+05	8.80E+05	8.70E+05	8	8.28E+05	-5	ND		0.00E+00	NA	ND	0.00E+00	NA

RT = Retention Time
CF = Calibration Factor
PID = Photo-Ionization Detector

µg/L = Micrograms per Liter
µL = Microliters
µg = Microgram

ARF = Average Response Factor
RPD = Relative Percent Difference
LCS = Laboratory Control Sample

ND = Not Detected
NA = Not Applicable

ANALYST: David M. Pride

REVIEWED BY: Ragi Abraham

APPENDIX B
USCS CRITERIA

Unified Soil Classification System

Compiled by B. W. Pipkin, University of Southern California

MAJOR DIVISIONS			GROUP SYMBOLS	TYPICAL NAMES
COARSE-GRAINED SOILS More than half of material is larger than no. 200 sieve size.	GRAVELS More than half of coarse fraction is larger than no. 4 sieve size.	Clean gravels	GW	Well-graded gravels, gravel-sand mixtures, little or no fines.
		Gravels with fines	GP	Poorly graded gravels, gravel-sand mixtures, little or no fines.
			GM	Silty gravels, gravel-sand-silt mixtures.
		SANDS More than half of coarse fraction is smaller than no. 4 sieve size.	Clean sands	GC
	SW			Well-graded sands, gravelly sands, little or no fines.
	Sands with fines		SP	Poorly graded sands, gravelly sands, little or no fines.
			SM	Silty sands, sand-silt mixtures.
	FINE-GRAINED SOILS More than half of material is smaller than no. 200 sieve size.	SILTS AND CLAYS	Low liquid limit.	SC
ML				Inorganic silts and very fine sands, rock flour, silty or clayey fine sands, or clayey silts, with slight plasticity.
CL				Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays.
High liquid limit.			OL	Organic silts and organic silty clays of low plasticity.
			MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts.
			CH	Inorganic clays of high plasticity, fat clays.
			OH	Organic clays of medium to high plasticity, organic silts.
Highly organic soils			Pt	Peat and other highly organic silts.

NOTES:

1. Boundary Classification: Soils possessing characteristics of two groups are designated by combinations of group symbols. For example, GW-GC, well-graded gravel-sand mixture with clay binder.

2. All sieve sizes on this chart are U.S. Standard.

3. The terms "silt" and "clay" are used respectively to distinguish materials exhibiting lower plasticity from those with higher plasticity. The minus no. 200 sieve material is silt if the liquid limit and plasticity index plot below the "A" line on the plasticity chart (next page), and is clay if the liquid limit and plasticity index plot above the "A" line on the chart.

4. For a complete description of the Unified Soil Classification System, see "Technical Memorandum No. 3-357," prepared for Office, Chief of Engineers, by Waterways Equipment Station, Vicksburg, Mississippi, March 1953. (See also Data Sheet 17.)

APPENDIX C
SIEVE ANALYSES RESULTS FOR SOIL SAMPLES

ANAHEIM TEST LABORATORY

3002 S. ORANGE AVENUE
SANTA ANA, CALIFORNIA 92707
PHONE (714) 549-7267

EST ENVIRONMENTAL SUPPORT TECH:
23011 MOULTON PARKWAY STE. E-6
LAGUNA HILLS, CA. 92653

ATTN: MICHAEL TYE

DATE: 4-10-97

P.O. No. VERBAL

Shipper No.

Lab. No. B 1514 1-6

Specification:

Material: SOIL

PROJECT: CONTINENTAL HEAT TREATING:

CHT-B1

RESULTS OF SIEVE ANALYSIS TESTING

SIEVE SIZE	Percent Passing					
	No. 1 @ 10'	No. 2 @ 20'	No. 3 @ 30'	No. 4 @ 40'	No. 5 @ 50'	No. 6 @ 60'
#4	100	100	100	100	100	100
#8	100	97	100	98	100	99
#16	99	95	100	96	100	95
#30	97	94	99	93	100	89
#50	86	92	96	88	99	84
#100	68	91	88	78	94	80
#200	51	78	78	64	52	77

RESPECTFULLY SUBMITTED

ANAHEIM TEST LABORATORY

POPPY BRIDGER

Chief Chemist

APPENDIX D
SOIL BORING LOG

SOIL BORING LOG

CHT BORING LOG

05/06/97

ENVIRONMENTAL SUPPORT TECHNOLOGIES, INC.
23011 MOULTON PARKWAY, SUITE E-6
LAGUNA HILLS, CALIFORNIA 92653
(714) 457-9664

PROJECT NAME: Continental Heat Treating					BORING NUMBER: CHT-B1			
PROJECT No: EST1315					BORING LOGGED BY: M. Tye			
DATE: 3/27/97					DRILLING CONTRACTOR: Discovery Drilling			
BEGIN DRILLING: 8:53 AM					DRILLING METHOD: CME-55 with 10.5-inch O.D. augers			
END DRILLING: 12:11 PM					SITE LOCATION: 10643 South Norwalk Boulevard, Santa Fe Springs, CA.			
TIME	DEPTH	BLOW COUNTS	PERCENT RECOVERY	TOVs (ppm)	LITHOLOGIC DESCRIPTION	USCS SOIL TYPE	LAB SAMPLE	
7:40	0'	N/A	N/A	N/A	Surface = Concrete, approximately 5-inches-thick, hand-auger (HA) to 4-feet below grade.	N/A	N/A	
7:42	1'	N/A	HA Cuttings	54 ppm as isobutylene	Silty fine sand, brown (10YR 4/3), well-sorted, moist, no odor.	SM	N/A	
8:57	5'	21-27-35 (62)	100%	70 ppm as isobutylene	Clayey-silt with fine sand, brown (10YR 4/3), well-sorted very-dense, moist.	SM-ML	EPA 8021	
9:10	10'	20-24-45 (69)	100%	56 ppm as isobutylene	Clayey-silt with fine sand, brown (10YR 4/3), well-sorted very-dense, moist.	SM-ML	EPA 8021 SIEVE	
9:24	15'	30-40-70 (110)	100%	267 ppm as isobutylene	Silt, light brownish-gray (10YR 6/2), well-sorted, very-dense, moist.	ML	EPA 8021	
9:33	20'	27-35-70 (105)	100%	45 ppm as isobutylene	Silty clay, light brownish-gray (10YR 6/2), well-sorted, very-dense, moist.	ML-CL	EPA 8021 SIEVE	
9:45	25'	25-25-50 (75)	100%	48 ppm as isobutylene	Silty clay, pale brown (10YR 6/3), well-sorted, very-dense, moist.	ML-CL	EPA 8021	
9:58	30'	28-27-55 (82)	100%	114 ppm as isobutylene	Silty clay, pale brown (10YR 6/3), well-sorted, very-dense, moist.	ML-CL	EPA 8021 SIEVE	
10:06	35'	19-20-47 (67)	100%	50 ppm as isobutylene	Silty clay, pale brown (10YR 6/3), well-sorted, very-dense, moist.	ML-CL	EPA 8021	
10:20	40'	17-19-45 (64)	100%	59 ppm as isobutylene	Silt, brown (10YR 4/3), well-sorted, very-dense, moist.	ML	EPA 8021 SIEVE	
10:38	45'	20-22-52 (74)	100%	135 ppm as isobutylene	Silt, brown (10YR 4/3), well-sorted, very-dense, moist.	ML	EPA 8021	
11:25	50'	24-27-59 (86)	100%	53 ppm as isobutylene	Silty clay, pale brown (10YR 6/3), well-sorted, very-dense, moist.	ML-CL	EPA 8021 SIEVE	

HSA = hollow-stem auger
TOV = total organic vapors
LAB = soil sample analyzed by certified laboratory
EPA 8021 = sample analyzed for VOCs
ppm = parts per million
(xx) = sum of last two blow counts

NS = not sampled
USCS = United Soil Classification System
ND = not detected
Archived = soil sample archived at laboratory
N/A = not applicable
SIEVE = sieve analysis performed

1) USCS Classifications are field derived.

2) Color designations are Munsell.

3) Subsurface information from boring logs depict conditions only at specific locations and dates indicated. Soil conditions at other locations may differ from conditions at these locations. Also the conditions at these locations may change with time.

Prepared by Michael Tye

Reviewed by KL A. Thomson

SOIL BORING LOG

CHT BORING LOG (p.2)

05/06/97

ENVIRONMENTAL SUPPORT TECHNOLOGIES, INC.
23011 MOULTON PARKWAY, SUITE E-6
LAGUNA HILLS, CALIFORNIA 92653
(714) 457-9664

PROJECT NAME:	Continental Heat Treating				BORING NUMBER:	CHT-B1		
PROJECT No:	EST1315				BORING LOGGED BY:	M. Tye		
DATE:	3/27/97				DRILLING CONTRACTOR:	Discovery Drilling		
BEGIN DRILLING:	8:53 AM				DRILLING METHOD:	CME-55 with 10.5-inch O.D. augers		
END DRILLING:	12:11 PM				SITE LOCATION:	10643 South Norwalk Boulevard, Santa Fe Springs, CA.		
TIME	DEPTH	BLOW COUNTS	PERCENT RECOVERY	TOVs (ppm)		LITHOLOGIC DESCRIPTION	USCS SOIL TYPE	LAB SAMPLE
11:37	55'	20-25-28 (53)	100%	115 ppm as isobutylene		Clayey-silt, grayish-brown (10YR 5/2), well-sorted, very-dense, moist.	ML-CL	EPA 8021
11:56	60'	17-20-42 (62)	100%	25 ppm as isobutylene		Clayey-silt, grayish-brown (10YR 5/2), well-sorted, very-dense, moist.	ML-CL	EPA 8021 SIEVE
12:08	65'	35-50-100 (150)	100%	19 ppm as isobutylene		Medium sand with silt, gray (10YR 6/1), well-sorted, very-dense, very moist.	SM	EPA 8021
12:11	68'	32-45-80 (125)	100%	15 ppm as isobutylene		Medium sand with silt, gray (10YR 6/1), well-sorted, very-dense, wet.	SM	N/A
						DISCONTINUE DRILLING AND SOIL SAMPLING.		
						Total depth of boring CHT-B1 approximately 68-feet below grade, commence installation of nested soil gas probes at 60 and 50 feet below grade, and installation of 45-foot-deep vapor extraction well.		

HSA = hollow-stem auger
TOV = total organic vapors
LAB = soil sample analyzed by certified laboratory
EPA 8021 = sample analyzed for VOCs
ppm = parts per million
(xx) = sum of last two blow counts

1) USCS Classifications are field derived.

NS = not sampled
USCS = United Soil Classification System
ND = not detected
Archived = soil sample archived at laboratory
N/A = not applicable
SIEVE = sieve analysis performed

2) Color designations are Munsell.

3) Subsurface information from boring logs depict conditions only at specific locations and dates indicated.
Soil conditions at other locations may differ from conditions at these locations. Also the conditions at these locations may change with time.

Prepared by Michael TyeReviewed by K.A. Thomson

APPENDIX E

**LABORATORY ANALYSES REPORTS
AND CHAIN-OF-CUSTODY FORM
FOR SOIL SAMPLES**



Date: 4/4/97

Environmental Support Technologies, Inc.
23011 Moulton Parkway, Suite E-6
Laguna Hills, CA 92653
Attention: Mr. Kirk Thomson

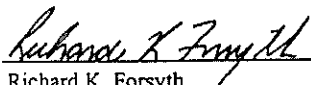
Client Project Number: Continental Heat Treating
Date Sampled: 3/27/97
Date Samples Received: 3/28/97
Sierra Project No.: 9703-296

Attached are the results of the chemo-physical analysis of the sample(s) from the project identified above.

The samples were received by Sierra Laboratories, Inc. with a chain of custody record attached or completed at the submittal of the samples.

The analysis were performed according to the prescribed method as outlined by EPA, Standard Methods, and A.S.T.M.

The remaining portions of the samples will be disposed of within 30 days from the date of this report. If you require additional retaining time, please advise us.


Richard K. Forsyth
Laboratory Director


Reviewed

This report is applicable only to the sample received by the laboratory. The liability of the laboratory is limited to the amount paid for this report. This report is for the exclusive use of the client to whom it is addressed and upon the condition that the client assumes all liability for the further distribution of the report or its contents.

Environmental Support Technologies, Inc.
23011 Moulton Parkway, Suite E-6
Laguna Hills, CA 92653

Date Sampled: 3/27/97

Date Received: 3/28/97

Date Prepared: 4/1/97

Date Analyzed: 4/1/97

Sierra Project No.: 9703-296

Analyst: SM

Client Project ID: Continental Heat Treating

Sample Matrix: Soil

Report Date: 4/4/97

HALOGENATED AND AROMATIC VOLATILE ORGANICS
EPA METHOD 8021

Client Sample No.:	Concentration, µg/kg				Method Detection Limit, µg/kg
	CHT-B1-5'	CHT-B1-10'	CHT-B1-15'	CHT-B1-20'	
Sierra Sample No.:	4563	4564	4565	4566	
COMPOUNDS:					
Benzene	ND	ND	ND	ND	3
Bromobenzene	ND	ND	ND	ND	3
Bromochloromethane	ND	ND	ND	ND	3
Bromodichloromethane	ND	ND	ND	ND	3
Bromoform	ND	ND	ND	ND	3
Bromomethane	ND	ND	ND	ND	3
n-Butylbenzene	ND	ND	ND	ND	3
sec-Butylbenzene	ND	ND	ND	ND	3
tert-Butylbenzene	ND	ND	ND	ND	3
Carbon tetrachloride	ND	ND	ND	ND	3
Chlorobenzene	ND	ND	ND	ND	3
Chlorodibromomethane	ND	ND	ND	ND	3
Chloroethane	ND	ND	ND	ND	3
Chloroform	ND	ND	ND	ND	3
Chloromethane	ND	ND	ND	ND	3
2-Chlorotoluene	ND	ND	ND	ND	3
4-Chlorotoluene	ND	ND	ND	ND	3
1,2-Dibromo-3-chloropropane	ND	ND	ND	ND	3
1,2-Dibromoethane	ND	ND	ND	ND	3
Dibromomethane	ND	ND	ND	ND	3
1,2-Dichlorobenzene	ND	ND	ND	ND	3
1,3-Dichlorobenzene	ND	ND	ND	ND	3
1,4-Dichlorobenzene	ND	ND	ND	ND	3
Dichlorodifluoromethane	ND	ND	ND	ND	3
1,1-Dichloroethane	ND	ND	ND	ND	3

CONTINUED

Environmental Support Technologies, Inc.		Date Sampled:	3/27/97
23011 Moulton Parkway, Suite E-6		Date Received:	3/28/97
Laguna Hills, CA 92653		Date Prepared:	4/1/97
		Date Analyzed:	4/1/97
Sierra Project No.:	9703-296	Analyst:	SM
Client Project ID:	Continental Heat Treating		
Sample Matrix:	Soil	Report Date:	4/4/97

EPA METHOD 8021 CONTINUED

Client Sample No.:	Concentration, µg/kg				Method Detection Limit, µg/kg
	CHT-B1-5'	CHT-B1-10'	CHT-B1-15'	CHT-B1-20'	
Sierra Sample No.:	4563	4564	4565	4566	
COMPOUNDS:					
1,2-Dichloroethane	ND	ND	ND	ND	3
1,1-Dichloroethene	ND	ND	ND	ND	3
cis-1,2-Dichloroethene	ND	ND	ND	ND	3
trans-1,2-Dichloroethene	ND	33	63	57	3
1,2-Dichloropropane	ND	ND	ND	ND	3
1,3-Dichloropropane	ND	ND	ND	ND	3
2,2-Dichloropropane	ND	ND	ND	ND	3
1,1-Dichloropropene	ND	ND	ND	ND	3
cis-1,3-dichloropropene	ND	ND	ND	ND	3
trans-1,3-dichloropropene	ND	ND	ND	ND	3
Ethylbenzene	ND	ND	ND	ND	3
Hexachlorobutadiene	ND	ND	ND	ND	3
Isopropylbenzene	ND	ND	ND	ND	3
p-Isopropyltoluene	ND	ND	ND	ND	3
Methylene chloride	ND	ND	ND	ND	3
Naphthalene	ND	ND	ND	ND	3
n-Propylbenzene	ND	ND	ND	ND	3
Styrene	ND	ND	ND	ND	3
1,1,1,2-Tetrachloroethane	ND	ND	ND	ND	3
1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	3
Tetrachloroethene	40	31	110	42	3
Toluene	ND	ND	ND	ND	3
1,2,3-Trichlorobenzene	ND	ND	ND	ND	3
1,2,4-Trichlorobenzene	ND	ND	ND	ND	3
1,1,1-Trichloroethane	ND	ND	ND	ND	3
1,1,2-Trichloroethane	ND	ND	ND	ND	3

CONTINUED

Environmental Support Technologies, Inc.		Date Sampled:	3/27/97
23011 Moulton Parkway, Suite E-6		Date Received:	3/28/97
Laguna Hills, CA 92653		Date Prepared:	4/1/97
		Date Analyzed:	4/1/97
Sierra Project No.:	9703-296	Analyst:	SM
Client Project ID:	Continental Heat Treating		
Sample Matrix:	Soil	Report Date:	4/4/97

EPA METHOD 8021 CONTINUED

Client Sample No.:	Concentration, µg/kg				Method Detection Limit, µg/kg
	CHT-B1-5'	CHT-B1-10'	CHT-B1-15'	CHT-B1-20'	
Sierra Sample No.:	4563	4564	4565	4566	
COMPOUNDS:					
Trichloroethene	20	9.6	17	14	3
Trichlorofluoromethane	ND	ND	ND	ND	3
1,2,3-Trichloropropane	ND	ND	ND	ND	3
1,2,4-Trimethylbenzene	ND	ND	ND	ND	3
1,3,5-Trimethylbenzene	ND	ND	ND	ND	3
Vinyl chloride	ND	ND	ND	ND	3
Total Xylenes	ND	ND	ND	ND	3
Dilution Factor	1	1	1	1	QC Limits
% Surrogate Recovery:					
1-chloro-2-fluorobenzene	81	81	82	80	30-135

Quality Assurance/Quality Control Data							
QC Sample ID: 9703-296-4575							
Compounds	LCS % Rec.	QC Limits	Spike % Rec.	Spike Dup % Rec.	QC Limits	RPD	QC Limits
1,1 Dichloroethane	102	80-120	102	104	47-132	1.2	0-30
Carbon Tetrachloride	102	80-120	105	106	43-143	0.5	0-30
Bromoform	110	80-120	110	108	13-159	2.3	0-30
Benzene	105	80-120	105	102	39-150	2.4	0-30
Toluene	105	80-120	105	102	46-148	2.4	0-30
Ethylbenzene	102	80-120	102	103	32-160	0.5	0-30

ND means Not Detected

Reporting Limit (RL) = Method Detection Limit (MDL) x Dilution Factor

Environmental Support Technologies, Inc.		Date Sampled:	3/27/97
23011 Moulton Parkway, Suite E-6		Date Received:	3/28/97
Laguna Hills, CA 92653		Date Prepared:	4/1/97
		Date Analyzed:	4/1/97
Sierra Project No.:	9703-296	Analyst:	SM
Client Project ID:	Continental Heat Treating	Report Date:	4/4/97
Sample Matrix:	Soil		

**HALOGENATED AND AROMATIC VOLATILE ORGANICS
EPA METHOD 8021**

Client Sample No.:	Concentration, µg/kg				Method Detection Limit, µg/kg
	CHT-B1-25'	CHT-B1-30'	CHT-B1-35'	CHT-B1-40'	
Sierra Sample No.:	4567	4568	4569	4570	
COMPOUNDS:					
Benzene	ND	ND	ND	ND	3
Bromobenzene	ND	ND	ND	ND	3
Bromochloromethane	ND	ND	ND	ND	3
Bromodichloromethane	ND	ND	ND	ND	3
Bromoform	ND	ND	ND	ND	3
Bromomethane	ND	ND	ND	ND	3
n- Butylbenzene	ND	ND	ND	ND	3
sec-Butylbenzene	ND	ND	ND	ND	3
tert-Butylbenzene	ND	ND	ND	ND	3
Carbon tetrachloride	ND	ND	ND	ND	3
Chlorobenzene	ND	ND	ND	ND	3
Chlorodibromomethane	ND	ND	ND	ND	3
Chloroethane	ND	ND	ND	ND	3
Chloroform	ND	ND	ND	ND	3
Chloromethane	ND	ND	ND	ND	3
2-Chlorotoluene	ND	ND	ND	ND	3
4-Chlorotoluene	ND	ND	ND	ND	3
1,2-Dibromo-3-chloropropane	ND	ND	ND	ND	3
1,2-Dibromoethane	ND	ND	ND	ND	3
Dibromomethane	ND	ND	ND	ND	3
1,2-Dichlorobenzene	ND	ND	ND	ND	3
1,3-Dichlorobenzene	ND	ND	ND	ND	3
1,4-Dichlorobenzene	ND	ND	ND	ND	3
Dichlorodifluoromethane	ND	ND	ND	ND	3
1,1-Dichloroethane	ND	ND	ND	ND	3

CONTINUED

Environmental Support Technologies, Inc.		Date Sampled:	3/27/97
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Laguna Hills, CA 92653		Date Prepared:	4/1/97
		Date Analyzed:	4/1/97
Sierra Project No.:	9703-296	Analyst:	SM
Client Project ID:	Continental Heat Treating	Report Date:	4/4/97
Sample Matrix:	Soil		

EPA METHOD 8021 CONTINUED

Client Sample No.:	Concentration, µg/kg				Method Detection Limit, µg/kg
	CHT-B1-25'	CHT-B1-30'	CHT-B1-35'	CHT-B1-40'	
Sierra Sample No.:	4567	4568	4569	4570	
COMPOUNDS:					
1,2-Dichloroethane	ND	ND	ND	ND	3
1,1-Dichloroethene	ND	ND	ND	ND	3
cis-1,2-Dichloroethene	ND	17	ND	ND	3
trans-1,2-Dichloroethene	ND	ND	ND	ND	3
1,2-Dichloropropane	ND	ND	ND	ND	3
1,3-Dichloropropane	ND	ND	ND	ND	3
2,2-Dichloropropane	ND	ND	ND	ND	3
1,1-Dichloropropene	ND	ND	ND	ND	3
cis-1,3-dichloropropene	ND	ND	ND	ND	3
trans-1,3-dichloropropene	ND	ND	ND	ND	3
Ethylbenzene	ND	ND	ND	ND	3
Hexachlorobutadiene	ND	ND	ND	ND	3
Isopropylbenzene	ND	ND	ND	ND	3
p-Isopropyltoluene	ND	ND	ND	ND	3
Methylene chloride	ND	ND	ND	ND	3
Naphthalene	ND	ND	ND	ND	3
n-Propylbenzene	ND	ND	ND	ND	3
Styrene	ND	ND	ND	ND	3
1,1,1,2-Tetrachloroethane	ND	ND	ND	ND	3
1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	3
Tetrachloroethene	29	50	8.4	16	3
Toluene	ND	ND	ND	ND	3
1,2,3-Trichlorobenzene	ND	ND	ND	ND	3
1,2,4-Trichlorobenzene	ND	ND	ND	ND	3
1,1,1-Trichloroethane	ND	ND	ND	ND	3
1,1,2-Trichloroethane	ND	ND	ND	ND	3

CONTINUED

Environmental Support Technologies, Inc.		Date Sampled:	3/27/97
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Laguna Hills, CA 92653		Date Prepared:	4/1/97
		Date Analyzed:	4/1/97
Sierra Project No.:	9703-296	Analyst:	SM
Client Project ID:	Continental Heat Treating		
Sample Matrix:	Soil	Report Date:	4/4/97

EPA METHOD 8021 CONTINUED

Concentration, µg/kg					Method Detection Limit, µg/kg
Client Sample No.:	CHT-B1-25'	CHT-B1-30'	CHT-B1-35'	CHT-B1-40'	
Sierra Sample No.:	4567	4568	4569	4570	
COMPOUNDS:					
Trichloroethene	7.0	9.4	ND	3.0	3
Trichlorofluoromethane	ND	ND	ND	ND	3
1,2,3-Trichloropropane	ND	ND	ND	ND	3
1,2,4-Trimethylbenzene	ND	ND	ND	ND	3
1,3,5-Trimethylbenzene	ND	ND	ND	ND	3
Vinyl chloride	ND	ND	ND	ND	3
Total Xylenes	ND	ND	ND	ND	3
Dilution Factor	1	1	1	1	QC Limits
% Surrogate Recovery: 1-chloro-2-fluorobenzene	75	78	85	80	30-135

Quality Assurance/Quality Control Data							
QC Sample ID: 9703-296-4575							
Compounds	LCS % Rec.	QC Limits	Spike % Rec.	Spike Dup % Rec.	QC Limits	RPD	QC Limits
1,1 Dichloroethane	102	80-120	102	104	47-132	1.2	0-30
Carbon Tetrachloride	102	80-120	105	106	43-143	0.5	0-30
Bromoform	110	80-120	110	108	13-159	2.3	0-30
Benzene	105	80-120	105	102	39-150	2.4	0-30
Toluene	105	80-120	105	102	46-148	2.4	0-30
Ethylbenzene	102	80-120	102	103	32-160	0.5	0-30

ND means Not Detected

Reporting Limit (RL) = Method Detection Limit (MDL) x Dilution Factor

Environmental Support Technologies, Inc.
23011 Moulton Parkway, Suite E-6
Laguna Hills, CA 92653

Date Sampled: 3/27/97

Date Received: 3/28/97

Date Prepared: 4/1/97

Date Analyzed: 4/1/97

Sierra Project No.: 9703-296

Analyst: SM

Client Project ID: Continental Heat Treating

Sample Matrix: Soil

Report Date: 4/4/97

HALOGENATED AND AROMATIC VOLATILE ORGANICS
EPA METHOD 8021

Concentration, µg/kg					Method Detection Limit, µg/kg
Client Sample No.:	CHT-B1-45'	CHT-B1-50'	CHT-B1-55'	CHT-B1-60'	
Sierra Sample No.:	4571	4572	4573	4574	
COMPOUNDS:					
Benzene	ND	ND	ND	ND	3
Bromobenzene	ND	ND	ND	ND	3
Bromochloromethane	ND	ND	ND	ND	3
Bromodichloromethane	ND	ND	ND	ND	3
Bromoform	ND	ND	ND	ND	3
Bromomethane	ND	ND	ND	ND	3
n- Butylbenzene	ND	ND	ND	ND	3
sec-Butylbenzene	ND	ND	ND	ND	3
tert-Butylbenzene	ND	ND	ND	ND	3
Carbon tetrachloride	ND	ND	ND	ND	3
Chlorobenzene	ND	ND	ND	ND	3
Chlorodibromomethane	ND	ND	ND	ND	3
Chloroethane	ND	ND	ND	ND	3
Chloroform	ND	ND	ND	ND	3
Chloromethane	ND	ND	ND	ND	3
2-Chlorotoluene	ND	ND	ND	ND	3
4-Chlorotoluene	ND	ND	ND	ND	3
1,2-Dibromo-3-chloropropane	ND	ND	ND	ND	3
1,2-Dibromoethane	ND	ND	ND	ND	3
Dibromomethane	ND	ND	ND	ND	3
1,2-Dichlorobenzene	ND	ND	ND	ND	3
1,3-Dichlorobenzene	ND	ND	ND	ND	3
1,4-Dichlorobenzene	ND	ND	ND	ND	3
Dichlorodifluoromethane	ND	ND	ND	ND	3
1,1-Dichloroethane	ND	ND	ND	ND	3

CONTINUED

Environmental Support Technologies, Inc.		Date Sampled:	3/27/97
23011 Moulton Parkway, Suite E-6		Date Received:	3/28/97
Laguna Hills, CA 92653		Date Prepared:	4/1/97
		Date Analyzed:	4/1/97
Sierra Project No.:	9703-296	Analyst:	SM
Client Project ID:	Continental Heat Treating	Report Date:	4/4/97
Sample Matrix:	Soil		

EPA METHOD 8021 CONTINUED

Client Sample No.:	Concentration, µg/kg				Method Detection Limit, µg/kg
	CHT-B1-45'	CHT-B1-50'	CHT-B1-55'	CHT-B1-60'	
Sierra Sample No.:	4571	4572	4573	4574	
COMPOUNDS:					
1,2-Dichloroethane	ND	ND	ND	ND	3
1,1-Dichloroethene	ND	ND	ND	ND	3
cis-1,2-Dichloroethene	ND	17	ND	ND	3
trans-1,2-Dichloroethene	ND	ND	ND	ND	3
1,2-Dichloropropane	ND	ND	ND	ND	3
1,3-Dichloropropane	ND	ND	ND	ND	3
2,2-Dichloropropane	ND	ND	ND	ND	3
1,1-Dichloropropene	ND	ND	ND	ND	3
cis-1,3-dichloropropene	ND	ND	ND	ND	3
trans-1,3-dichloropropene	ND	ND	ND	ND	3
Ethylbenzene	ND	ND	ND	ND	3
Hexachlorobutadiene	ND	ND	ND	ND	3
Isopropylbenzene	ND	ND	ND	ND	3
p-Isopropyltoluene	ND	ND	ND	ND	3
Methylene chloride	ND	ND	ND	ND	3
Naphthalene	ND	ND	ND	ND	3
n-Propylbenzene	ND	ND	ND	ND	3
Styrene	ND	ND	ND	ND	3
1,1,1,2-Tetrachloroethane	ND	ND	ND	ND	3
1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	3
Tetrachloroethene	27	4.8	5.2	130	3
Toluene	ND	ND	ND	6.5	3
1,2,3-Trichlorobenzene	ND	ND	ND	ND	3
1,2,4-Trichlorobenzene	ND	ND	ND	ND	3
1,1,1-Trichloroethane	ND	ND	ND	ND	3
1,1,2-Trichloroethane	ND	ND	ND	ND	3

CONTINUED

Environmental Support Technologies, Inc.		Date Sampled:	3/27/97
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Laguna Hills, CA 92653		Date Prepared:	4/1/97
		Date Analyzed:	4/1/97
Sierra Project No.:	9703-296	Analyst:	SM
Client Project ID:	Continental Heat Treating	Report Date:	4/4/97
Sample Matrix:	Soil		

EPA METHOD 8021 CONTINUED

Client Sample No.:	Concentration, µg/kg				Method Detection Limit, µg/kg
	CHT-B1-45'	CHT-B1-50'	CHT-B1-55'	CHT-B1-60'	
Sierra Sample No.:	4571	4572	4573	4574	
COMPOUNDS:					
Trichloroethene	4.0	ND	ND	7.7	3
Trichlorofluoromethane	ND	ND	ND	ND	3
1,2,3-Trichloropropane	ND	ND	ND	ND	3
1,2,4-Trimethylbenzene	ND	ND	ND	ND	3
1,3,5-Trimethylbenzene	ND	ND	ND	ND	3
Vinyl chloride	ND	ND	ND	ND	3
Total Xylenes	ND	ND	ND	ND	3
Dilution Factor	1	1	1	1	QC Limits
% Surrogate Recovery: 1-chloro-2-fluorobenzene	83	85	96	95	30-135

Quality Assurance/Quality Control Data							
QC Sample ID: 9703-296-4575							
Compounds	LCS % Rec.	QC Limits	Spike % Rec.	Spike Dup % Rec.	QC Limits	RPD	QC Limits
1,1 Dichloroethane	102	80-120	102	104	47-132	1.2	0-30
Carbon Tetrachloride	102	80-120	105	106	43-143	0.5	0-30
Bromoform	110	80-120	110	108	13-159	2.3	0-30
Benzene	105	80-120	105	102	39-150	2.4	0-30
Toluene	105	80-120	105	102	46-148	2.4	0-30
Ethylbenzene	102	80-120	102	103	32-160	0.5	0-30

ND means Not Detected

Reporting Limit (RL) = Method Detection Limit (MDL) x Dilution Factor

Environmental Support Technologies, Inc.		Date Sampled:	3/27/97
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Laguna Hills, CA 92653		Date Prepared:	4/1/97
		Date Analyzed:	4/1/97
Sierra Project No.:	9703-296	Analyst:	SM
Client Project ID:	Continental Heat Treating		
Sample Matrix:	Soil	Report Date:	4/4/97

HALOGENATED AND AROMATIC VOLATILE ORGANICS
EPA METHOD 8021

		Concentration, µg/kg			Method Detection Limit, µg/kg
Client Sample No.:	CHT-B1-65'				
Sierra Sample No.:	4575				
COMPOUNDS:					
Benzene	ND				3
Bromobenzene	ND				3
Bromochloromethane	ND				3
Bromodichloromethane	ND				3
Bromoform	ND				3
Bromomethane	ND				3
n- Butylbenzene	ND				3
sec-Butylbenzene	ND				3
tert-Butylbenzene	ND				3
Carbon tetrachloride	ND				3
Chlorobenzene	ND				3
Chlorodibromomethane	ND				3
Chloroethane	ND				3
Chloroform	ND				3
Chloromethane	ND				3
2-Chlorotoluene	ND				3
4-Chlorotoluene	ND				3
1,2-Dibromo-3-chloropropane	ND				3
1,2-Dibromoethane	ND				3
Dibromomethane	ND				3
1,2-Dichlorobenzene	ND				3
1,3-Dichlorobenzene	ND				3
1,4-Dichlorobenzene	ND				3
Dichlorodifluoromethane	ND				3
1,1-Dichloroethane	ND				3

CONTINUED

Environmental Support Technologies, Inc.		Date Sampled:	3/27/97
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		Date Analyzed:	4/1/97
Sierra Project No.:	9703-296	Analyst:	SM
Client Project ID:	Continental Heat Treating	Report Date:	4/4/97
Sample Matrix:	Soil		

EPA METHOD 8021 CONTINUED

Concentration, µg/kg					Method Detection Limit, µg/kg
Client Sample No.:	CHT-B1-65'				
Sierra Sample No.:	4575				
COMPOUNDS:					
1,2-Dichloroethane	ND				3
1,1-Dichloroethene	ND				3
cis-1,2-Dichloroethene	ND				3
trans-1,2-Dichloroethene	ND				3
1,2-Dichloropropane	ND				3
1,3-Dichloropropane	ND				3
2,2-Dichloropropane	ND				3
1,1-Dichloropropene	ND				3
cis-1,3-dichloropropene	ND				3
trans-1,3-dichloropropene	ND				3
Ethylbenzene	ND				3
Hexachlorobutadiene	ND				3
Isopropylbenzene	ND				3
p-Isopropyltoluene	ND				3
Methylene chloride	ND				3
Naphthalene	ND				3
n-Propylbenzene	ND				3
Styrene	ND				3
1,1,1,2-Tetrachloroethane	ND				3
1,1,2,2-Tetrachloroethane	ND				3
Tetrachloroethene	ND				3
Toluene	ND				3
1,2,3-Trichlorobenzene	ND				3
1,2,4-Trichlorobenzene	ND				3
1,1,1-Trichloroethane	ND				3
1,1,2-Trichloroethane	ND				3

CONTINUED

Environmental Support Technologies, Inc.		Date Sampled:	3/27/97
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Sierra Project No.:	9703-296	Analyst:	SM
Client Project ID:	Continental Heat Treating		
Sample Matrix:	Soil	Report Date:	4/4/97

EPA METHOD 8021 CONTINUED

Concentration, µg/kg					Method Detection Limit, µg/kg
Client Sample No.:	CHT-B1-65'				
Sierra Sample No.:	4575				
COMPOUNDS:					
Trichloroethene	ND				3
Trichlorofluoromethane	ND				3
1,2,3-Trichloropropane	ND				3
1,2,4-Trimethylbenzene	ND				3
1,3,5-Trimethylbenzene	ND				3
Vinyl chloride	ND				3
Total Xylenes	ND				3
Dilution Factor	1				QC Limits
% Surrogate Recovery:					
1-chloro-2-fluorobenzene	110				30-135

Quality Assurance/Quality Control Data							
QC Sample ID: 9703-296-4575							
Compounds	LCS % Rec.	QC Limits	Spike % Rec.	Spike Dup % Rec.	QC Limits	RPD	QC Limits
1,1 Dichloroethane	102	80-120	102	104	47-132	1.2	0-30
Carbon Tetrachloride	102	80-120	105	106	43-143	0.5	0-30
Bromoform	110	80-120	110	108	13-159	2.3	0-30
Benzene	105	80-120	105	102	39-150	2.4	0-30
Toluene	105	80-120	105	102	46-148	2.4	0-30
Ethylbenzene	102	80-120	102	103	32-160	0.5	0-30

ND means Not Detected

Reporting Limit (RL) = Method Detection Limit (MDL) x Dilution Factor

7.0 PROPOSED SOIL CLEAN-UP LEVELS

Proposed soil clean-up levels (SCLs) were calculated using the LARWQCB Attenuation Factor Method (LARWQCB, February 1996). The attenuation factor method consists of a series of equations, into which site-specific variables (including depth-to-groundwater, subsurface lithology, and the identity of the contaminant(s) are input.

Parameters used to calculate SCLs for the CHT site included depth-to-groundwater of 68 feet, silt lithology from grade to the water table, and PCE and TCE as contaminants. Proposed SCLs are presented in **Table 3**. Maximum detected values of PCE and TCE (excluding soil gas values for the northwest corner of the site due to potential off-site source) in soil and soil gas are summarized and compared to proposed SCLs in **Table 4**.

8.0 CONCLUSIONS

Soil in the vicinity of the former degreaser has been impacted primarily by PCE and TCE from grade to the water table, as indicated by analytical results for soil gas and soil samples. Concentrations of PCE and TCE detected in soil gas samples collected from approximately 5, 15, 25, and 35-feet below grade exceed proposed SCLs. Concentrations of PCE and TCE detected in soil samples collected from the boring are below proposed SCLs, with the exception of soil sample CHT-B1-60, collected from approximately 60 feet below grade.

9.0 RECOMMENDATIONS

Based on the results of the subsurface investigation and on our experience with similar projects, EST recommends assessing the feasibility of vadose zone remediation using vapor extraction technology.

Upon encountering first groundwater and completion of soil sampling, nested soil gas sampling probes were installed at approximately 50 and 60 feet below grade in the bore-hole during back-filling. Upon back-filling to approximately 45 feet below grade, a vapor extraction well was installed in the bore-hole to address VOC-impacted soil as indicated by prior soil gas analyses results. The vapor extraction well was completed slightly above grade using a traffic-rated well-cover set in concrete.

A total of 13 soil samples were collected from the boring and analyzed for VOCs by a state-certified environmental laboratory (Sierra Laboratories, Laguna Hills, California - ELAP No. 1805). Additionally, six (6) soil samples collected at approximate 10-foot-intervals from the boring were subjected to sieve analysis to verify visual soil classification performed during drilling.

Concentrations of PCE were detected in soil samples collected from 5 to 60 feet below grade. Detected concentrations of PCE in soil ranged from 4.8 micrograms per kilogram ($\mu\text{g/Kg}$) to a maximum of 130 $\mu\text{g/Kg}$ at approximately 60 feet below grade (sample CHT-B1-60). Concentrations of TCE were detected in soil samples collected from 5 to 30 feet below grade, and at approximately 40, 45, and 60 feet below grade. Detected concentrations of TCE in soil samples ranged from 3 $\mu\text{g/Kg}$ to a maximum of 20 $\mu\text{g/Kg}$ at approximately 5 feet below grade (sample CHT-B1-5). Concentrations of TCE were not detected above the laboratory method detection limit (MDL) of 3 $\mu\text{g/Kg}$ in soil samples collected from approximately 35, 50, 55, and 65 feet below grade. Concentrations of cis-1,2-dichloroethene (maximum 17 $\mu\text{g/Kg}$) were detected in two soil samples. Toluene was detected in one soil sample collected from approximately 60 feet below grade at a concentration of 6.5 $\mu\text{g/Kg}$.

Recommendations for the CHT site with respect to results of the subsurface investigation include assessing the feasibility of vadose zone remediation using vapor extraction technology.

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**REMEDIAL INVESTIGATION
WORK PLAN**

**CONTINENTAL HEAT TREATING
10643 SOUTH NORWALK BOULEVARD
SANTA FE SPRINGS, CALIFORNIA**

Prepared for:

**Continental Heat Treating
10643 South Norwalk Boulevard
Santa Fe Springs, California 90221**

Prepared by:

**Environmental Support Technologies, Inc.
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Project EST1315

September 27, 1996

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1.0 EXECUTIVE SUMMARY

Environmental Support Technologies, Inc. (EST) has prepared this Remedial Investigation Work Plan (RIWP) for the Continental Heat Treating (CHT) site, in response to a request from Mr. Jim Stull of CHT. Mr. Stull requested the remedial investigation to satisfy requirements put forth by the Site Mitigation Unit Health Hazardous Materials Division of the County of Los Angeles Fire Department (LACFD).

Previous site assessment work at the CHT site, including soil and soil gas sampling and analysis, indicated the presence of elevated concentrations of volatile organic compounds (VOCs) in the vadose zone. The proposed remedial investigation work will include a phase 2 multi-depth soil gas survey to be followed by multi-depth soil sampling and analysis. The objective of the remedial investigation is to further assess the lateral and vertical extent of VOCs in soil, and to assess the necessity of additional sampling work, site remediation, and to evaluate the most effective site remediation techniques (if necessary). The remedial investigation work will focus on the area of a former vapor degreaser, as stipulated by representatives of the LACFD.

2.0 SITE DESCRIPTION

The CHT site is located at 10643 South Norwalk Boulevard in Santa Fe Springs, California (Figure 1). The site is a 1.6 acre rectangular parcel with approximately 175 feet of frontage on South Norwalk Boulevard and 400 feet of depth west of South Norwalk Boulevard (Figure 2). The eastern portion of the site is surfaced with concrete, the western portion is surfaced with asphalt. The CHT site is bounded to the north by property owned by Mobil Oil, to the west and south by Hathaway (an oil company), and to the east by South Norwalk Boulevard. The site is improved with a 100-foot by 200-foot single-story building which is being used as a metal heat-treating facility.

2.1 SITE USE AND HISTORY

The site has been used as a metal heat-treating facility since 1969. Prior to 1969 the site was believed to have been vacant; however, it is located in a neighborhood with a heavy concentration of oil fields and it is likely that the site was used as an oil field or in the support of oil field activities in the past. The site currently contains multiple furnaces and has been issued EPA Identification No. CAD053850296.

2.2 DEPTH-TO-GROUNDWATER

The Los Angeles County Department of Public Works (LACDPW) maintains Well No. 1626L at the intersection of Fulton Wells Avenue and Florence Avenue in Santa Fe Springs, California. This well is approximately 1/6th of a mile from the CHT site. A July 22, 1995 sounding of this well by the LACDPW indicated that groundwater is approximately 66.5 feet below grade in the vicinity of the CHT site.

3.0 PREVIOUS SITE ASSESSMENT WORK

Previous site assessment work at the CHT site included soil sampling and analysis and a multi-depth soil gas survey.

3.1 PREVIOUS SOIL SAMPLING AND ANALYSIS

On February 6, 1995, Green Environmental, Inc. conducted soil sampling and analysis at the CHT site. A single 10-foot-deep soil boring was advanced in the vicinity of the a former vapor degreaser unit inside of the CHT building. Soil samples were collected from 0.5, 5, and 10 feet below grade and analyzed for VOCs using EPA method 8240. Concentrations of 7,514 micrograms per kilogram ($\mu\text{g}/\text{kg}$) of tetrachloroethene (PCE) and 4,759 $\mu\text{g}/\text{kg}$ of trichloroethene (TCE) were detected in the soil sample collected at 0.5 feet below grade. Concentrations of 290 $\mu\text{g}/\text{kg}$ of PCE and 21 $\mu\text{g}/\text{kg}$ of TCE were detected in the soil sample collected at 5 feet below grade, and concentrations of 66 $\mu\text{g}/\text{kg}$ of PCE and 1,855 $\mu\text{g}/\text{kg}$ of TCE were detected in the soil sample collected at 10 feet below grade.

3.2 PREVIOUS MULTI-DEPTH SOIL GAS SURVEY

On May 2, 1996, EST performed a multi-depth soil gas survey at the CHT site. Soil gas probes were installed inside of the building in the vicinity of the former vapor degreaser as well as along the northern property line and in the western asphalt paved area. The locations of previously installed soil gas probes are shown in Figure 3. Concentrations of VOCs detected in collected soil gas samples included PCE, TCE, vinyl chloride (VC), dichloroethene (DCE), trans-1,2-dichloroethene (T-DCE), cis-1,2-dichloroethene (C-DCE), chloroform (CFM), ethyl benzene (EBENZ), meta and para xylene (M&P-XYL), and ortho xylene (O-XYL). Detected concentrations of PCE, the most commonly detected VOC, ranged from 2 $\mu\text{g}/\text{L}$ to 41,300 $\mu\text{g}/\text{L}$ and are shown in Figure 4. Detected concentrations of PCE appeared highest in the vicinity of the former vapor degreaser and in the northwest corner of the CHT site. Conversations with the LACFD and CHT site representatives indicated that the elevated concentrations of PCE in the northwest corner of the CHT site are likely the result of off-site sources and will not be part of the CHT remedial investigation.

4.0 OBJECTIVE OF REMEDIAL INVESTIGATION WORK

The objectives of the proposed remedial investigation work are to:

- Further assess the lateral and vertical extent of soil contamination by VOCs in the area of the former vapor degreaser.
- Assess the potential need and options for remediation.

5.0 HEALTH AND SAFETY PLAN

Prior to initiating field work, EST will prepare a Health and Safety Plan (HSP). The HSP will provide the procedures to be followed to protect on-site and off-site personnel from potential hazards associated with the proposed work. The HSP will be reviewed by field personnel prior to initiating the work, and will be kept on site in an accessible location. The HSP will also dictate the protective equipment to be used, contingency plans in case of an accident, and emergency numbers for health personnel and hospitals. Site personnel will have their current OSHA 40-hour hazardous waste training certificates available on site. An on-site health and safety meeting will be conducted prior to each day of field work.

6.0 SAMPLING AND ANALYSIS PLAN

Remedial investigation work will focus on the area of the former vapor degreaser and will include two phases of work. The first phase of work will be a multi-depth soil gas survey to aid in identifying the location with the highest vadose zone concentration of VOCs. The second phase of work will be the installation of a soil boring and soil sampling and analysis. The location of the soil boring will be based on the results of the multi-depth soil gas survey.

6.1 MULTI-DEPTH SOIL GAS SURVEY

EST will perform a multi-depth soil gas survey in accordance with the Los Angeles Regional Water Quality Control Board (LARWQCB) "Requirements for Active Soil Gas Investigation" dated March 14, 1996. A telephone conversation with Mr. George Baker of the LACFD indicated that the March 14, 1996 LARWQCB protocols are acceptable to the LACFD. Some procedures may be modified based on evaluation of project needs. Modifications to these procedures, if necessary, will be approved by the LACFD prior to implementation and will be described in the soil gas survey report.

6.1.1 RATIONALE FOR SOIL GAS PROBE LOCATIONS

EST will install six (6) 15-foot soil gas sampling probes, three (3) 25-foot soil gas sampling probes and two (2) 35-foot soil gas sampling probes. The locations of the proposed 15-foot soil gas sampling probes are shown in Figure 5. The objective of these probes will be to evaluate relative concentrations of VOCs at 15-feet below grade in the vicinity of the former vapor degreaser. One 15-foot probe has also been located along the northern boundary of the CHT site to evaluate potential migration of PCE onto the CHT site from off-site sources. The three (3) 25-foot probes will be installed at the locations where the highest concentrations of VOCs are detected in soil gas samples collected from the 15-foot probes. The two (2) 35-foot probes will be located where the highest concentrations of VOCs are detected in the 25-foot samples. Probe locations and depths may vary based on site-specific subsurface geologic conditions (ie refusal), field analyses results, and revised project objectives.

6.1.2 SOIL GAS PROBE INSTALLATION AND COMPLETION

A typical soil gas sampling probe is shown in Figure 6. Probes will be installed using either a percussion hammer or hydraulic ram with percussion hammer. Once a probe has been installed to the desired depth, the probe shaft will be withdrawn, leaving the probe point and sampling tube in the subsurface. A small amount of silica sand will be poured into the probe hole to allow soil gas to migrate to the sampling point. The remaining annulus will be backfilled with cement/bentonite grout to grade. Upon completion of soil gas sampling, the sampling tube will be plugged with a stainless-steel machine screw and pushed below grade. The remaining depression will be completed at grade using concrete patch material. The probe point and sampling tube assembly will be left as a long-term soil gas monitoring point, unless otherwise specified prior to entering the field, to allow subsequent soil gas sampling and analysis, if desired.

6.1.3 SAMPLE COLLECTION AND HANDLING

Soil gas samples will be collected using the soil gas sampling system shown in Figure 7. Initially, site-specific probe purging and sample volume calibrations will be performed to evaluate the appropriate volume of gas to be purged from each probe prior to sample collection. This will be done by performing time-series sampling of at least one (1) probe to evaluate trends in soil gas concentrations as a function of purge volume. Soil gas samples will be analyzed in the field immediately following collection. Soil gas samples will be analyzed by direct gas injection into a laboratory-grade, field-operable gas chromatograph (GC).

6.1.4 SOIL GAS SAMPLE ANALYSIS

Soil gas samples will be analyzed in the field using a field-operable GC equipped with a photo-ionization detector (PID) and an electrolytic conductivity detector (ELCD). The PID and ELCD (if used) will be used in-series to analyze for target compounds as specified in the LARWQCB requirements (March 1994) including halogenated and aromatic hydrocarbons. Detection limits for the LARWQCB target compounds will be no more than one microgram per liter ($\mu\text{g/L}$) of gas except when a compound concentration exceeds the initial calibration range. When sample dilution (or smaller injection volume) is required to maintain analytes within the calibration range, this results in raised detection limits for the analysis. A series of quality assurance/quality control (QA/QC) analyses will be performed prior to, during, and following the analysis of soil gas samples. A summary of QA/QC analyses is presented in Table 1, and each analysis is described below.

6.1.5 INITIAL MULTI-POINT EQUIPMENT CALIBRATION

The chromatographic equipment used for soil gas analyses will be calibrated using high-purity solvent-based standards obtained from certified vendors or using gas standards prepared in the field (for TVHs). Standards are typically prepared in high-purity methanol or dodecane solvent. Calibration using solvent-based standards will be performed using varying injection volumes of the stock solvent-based standard without dilution. Stock solvent-based standards will be diluted to an appropriate concentration, if necessary. Diluted standards will be prepared by introducing a known volume of solvent-based standard into a known volume of high-purity solvent.

Initial calibration will be performed for EPA Method 8010/8020 compounds. The GC will be calibrated using three standard injections to establish a three-point calibration curve. The lowest standard will not be higher than five times the Method Detection Limit (or $5 \mu\text{g/L}$). The percent relative standard deviation (%RSD) of the response factor (RF) for each target compound will not exceed 20 percent except for trichlorofluoromethane (Freon 11), dichlorodifluoromethane (Freon 12), trichlorotrifluoromethane (Freon 113), chloroethane, and vinyl chloride which will not exceed 30 %RSD. Identification and quantitation of compounds in the field will be based on calibration under the same analytical conditions as for three-point calibration.

6.1.6 LABORATORY CONTROL SAMPLE (LCS)

A laboratory control sample (LCS) from a second source independent from the initial calibration standard will be used to verify the true concentration of the initial calibration standard. The LCS will include the LARWQCB target compounds and the RF for each compound will be within 15 percent of the initial calibration.

6.1.7 DAILY MID-POINT CALIBRATION CHECK

Daily calibration of the gas chromatograph will consist of a mid-point calibration analyses using the same standard as used for the initial multi-point calibration. The daily mid-point calibration check will include the 12 target compounds as specified in the LARWQCB requirement (March 1994). The RF of each compound (except for Freons 11, 12, and 113, chloroethane, and vinyl chloride) will be within 15 percent difference of the average RF from the initial calibration. The RF for the Freons 11, 12, and 113, chloroethane, and vinyl chloride will be within 25 percent difference of the initial calibration. If these criteria are not met, the GC will be re-calibrated. Daily calibration will be performed prior to the first sample analysis of the day. One-point calibration will be performed for all compounds detected at a particular site to ensure accurate quantitation. Subsequent calibration episodes, if deemed necessary, will consist of at least one injection of the standard exhibiting a similar detector response as that of samples encountered in the field.

6.1.8 BLANK INJECTIONS

Prior to sampling each day, a syringe used for soil gas sample collection will be filled with ambient air or ultra-high-purity carrier-grade gas from a compressed gas cylinder. The ambient air or high-purity gas will be injected directly into the GC. The blank injection will serve to detect potential cross-contamination of the sampling syringe, and to verify the effectiveness of equipment decontamination procedures.

6.1.9 END OF DAY GC TEST RUN

A LCS will be analyzed at the end of each day. The LCS will contain the same compounds as the daily mid-point calibration standard (minimum 12 compounds). The LCS must be from a second source independent from the initial multi-point calibration standard. The RF for each compound will be within 20 percent difference of the average RF for the initial calibration. If this criteria is not met, additional LCS will be analyzed to satisfy this criteria.

6.1.10 DECONTAMINATION PROCEDURES

Probes and equipment in contact with the soil gas sample stream will be decontaminated prior to initiation of sampling. Decontamination of soil gas sampling equipment will be conducted by repeated washing and/or by baking in the gas chromatograph oven. Washing will include the use of a phosphate-free detergent wash, tap water rinse, organic-free water rinse, and followed by air drying.

6.1.11 SHORTENING THE GC RUN TIME

Shortening the GC run time is acceptable only if the chemist feels that doing so will not sacrifice the quality of data obtained and doing so meets the approval of appropriate client and agency personnel.

6.1.12 REPORTING OF RESULTS AND QA/QC INFORMATION

Reporting of sample results and QA/QC information will be performed in accordance with the Los Angeles Regional Water Quality Control Board's "QA/QC and Reporting Requirement for Soil Gas Investigation" dated March 14, 1996.

6.2 SOIL SAMPLING AND ANALYSIS

+ Safety plan

This section describes the methods and procedures to be used to advance the proposed soil boring and to collect soil samples at the subject site. Some procedures may be modified and revised based on final evaluation of project needs. Modifications to these procedures, if necessary, will be approved by the LACFD prior to implementation and will be described in the remedial investigation report.

6.2.1 BORING LOCATION

The location of the soil boring will be based on the results of the Phase 1 and Phase 2 soil gas surveys. The soil gas probe cluster location which contained the highest concentrations of VOCs at the deepest depths will be selected as the location of the soil boring. Given the former vapor degreaser's location inside of the building, it is likely that the soil boring will be advanced inside the building.

6.2.2 SOIL BORING AND SOIL SAMPLING

The soil boring will be advanced using a CME-55 limited access drill rig equipped with 10.5-inch-diameter, continuous-flight, hollow-stem augers. The soil boring will be advanced to 60 feet below grade (groundwater is reported to be at approximately 65-feet below grade). If groundwater is estimated to be deeper than 65 feet below grade the boring will be advanced to 5-feet above groundwater. Soil samples will be collected at 5-foot intervals using a California-modified split-spoon sampler suspended on a down-hole hammer. Depths below grade will be measured using a weighted engineer's tape graduated in 0.01-foot increments. Soil samples will be classified and logged under the supervision of a Registered Geologist (RG) using the Unified Soil Classification System.

6.2.3 SOIL SAMPLE HANDLING AND IDENTIFICATION

Soil samples will be collected in a 2-inch sample barrel fitted with internal brass sample sleeves. Upon recovery of each sample, the ends of the brass soil sample tube will be covered with Parafilm™, and then capped with plastic end-caps and labeled. The following labeling system will be used for sample identification:

CHT-BX-Y, where

- CHT--identifies the location as the CHT site;
- BX--identifies soil boring number;
- Y--identifies the sample depth in feet below grade.

In addition to sample identification information, the sample identification label may also be used to record:

- Initials of personnel collecting samples
- Date and time of sample collection to the nearest minute.
- Requested analyses

Subsequent to labeling, the soil samples will be preserved on ice or in a refrigerator until delivery to a fixed laboratory.

6.2.4 SAMPLE CHAIN-OF-CUSTODY

The management of environmental samples collected in the field must follow specific procedures to ensure sample integrity. The possession of samples must be traceable from the time of collection until analysis by the contract laboratory.

Chain-of-custody of a sample is defined by the following criteria:

- The sample is in a person's possession or in his view after being in possession.
- The sample was in a person's possession and was locked up or transferred to a designated secure area.

Each time the sample(s) changes hands both the sender and receiver will sign and date the chain-of-custody form and specify what item(s) has changed hands. The second copy of the chain-of-custody form will be retained in the project files. The following information will be recorded on the chain-of-custody form.

- Sample number
- Signature of sampler
- Date and time of collection
- Place of collection
- Type of sample
- Number and type of container
- Inclusive dates of possession
- Signature of receiver

6.2.5 SOIL SAMPLE ANALYSES

The soil samples will be analyzed by a state-certified fixed environmental laboratory. (Sierra Laboratories, Laguna Hills, ELAP #1805). Soil samples will be analyzed for VOCs using EPA Method 8021. Soil samples collected at 10-foot intervals will also be analyzed for grain size using a sieve analyses.

6.2.6 DECONTAMINATION PROCEDURES

Quality Assurance/Quality Control (QA/QC) procedures will include decontamination of boring and sampling equipment to reduce the potential for cross-contamination. Soil boring and sampling equipment will be thoroughly decontaminated prior to arrival at the site. Soil sampling equipment will be decontaminated between collection of soil samples using the following procedure:

- A decontamination station will be set up in a secure area of the site located near a water supply. Plastic sheeting will be laid down on the ground beneath three wash basins.
- The first wash basin will contain a potable water/AlconoxTM detergent solution in which equipment will be immersed and scrubbed.
- The second wash basin will contain potable rinse water. Equipment being decontaminated will be removed from the detergent solution and rinsed thoroughly.
- The third wash basin will contain de-ionized water to be used for a final equipment rinse.
- Decontaminated soil sampling equipment will be wiped dry with paper towels and allowed to air-dry.

6.2.7 DISPOSAL/TREATMENT OF INVESTIGATION-DERIVED WASTE

Investigation-derived waste, including soil cuttings and clean-up debris, will be contained in properly labeled and secured 55-gallon steel drums and left on-site pending laboratory analyses results for soil samples. The proper storage, and treatment and/or disposal of wastes are the responsibility of CHT.

6.2.8 ABANDONMENT OF THE SOIL BORING

When soil sampling is complete, the soil boring will be back-filled with bentonite chips and hydrated. The surface of the boring finished flush at grade with concrete.

7.0 REPORT PREPARATION

A remedial investigation report will be prepared describing the results of the phase 1 and 2 soil gas surveys and the soil sampling and analysis. The report will include:

- Soil gas concentration data in tabular form.
- Soil sample concentration data in tabular form.
- Quality Assurance/Quality Control Data.
- Descriptions of any modifications made to the standard sampling and analyses methods typically used by EST.
- Boring logs for the soil boring.

A draft copy of the remedial investigation report will be submitted to CHT. Upon approval, EST will submit three copies of the remedial investigation report to the LACFD.

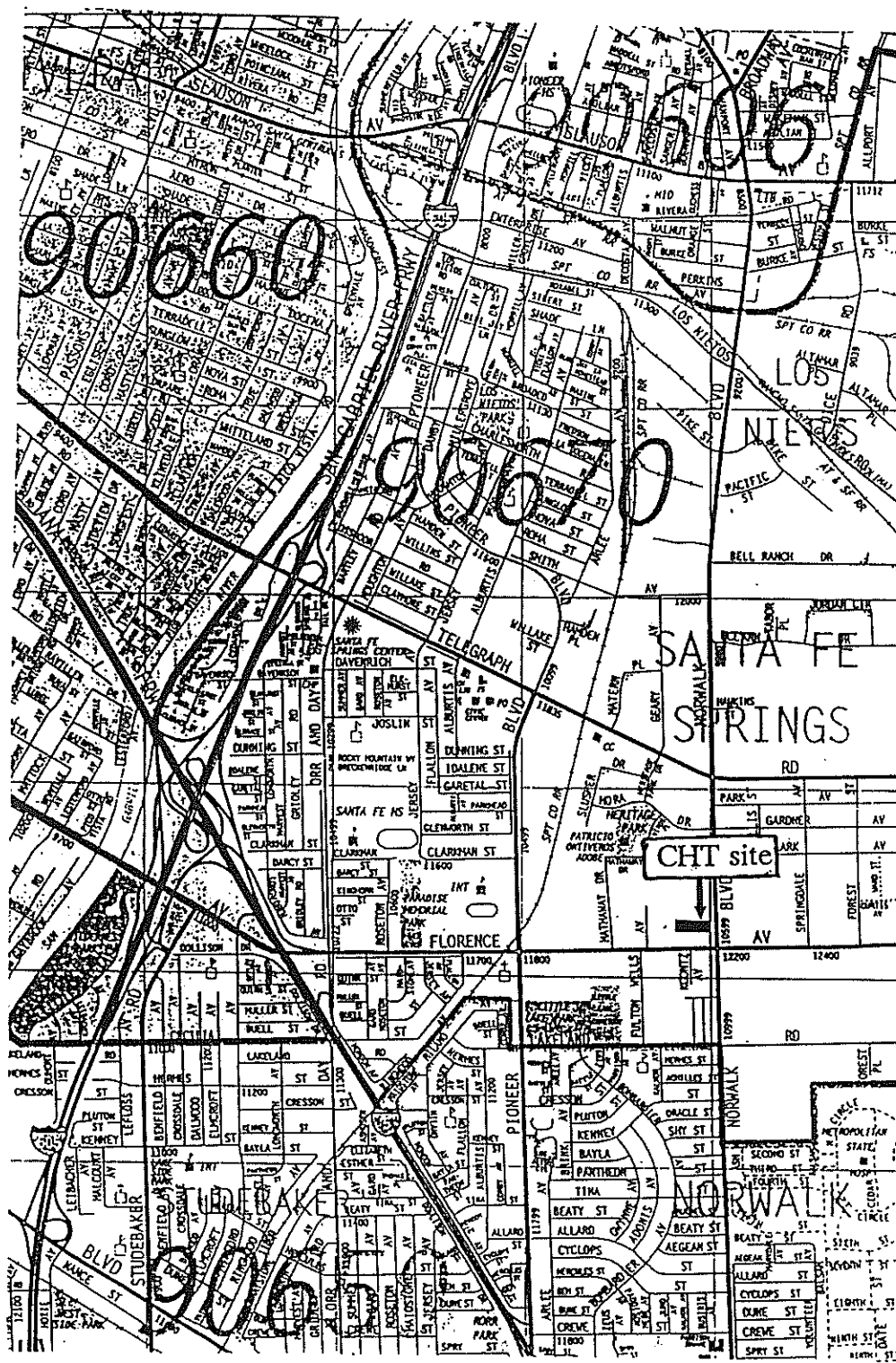


FIGURE 1

SITE LOCATION MAP

CONTINENTAL HEAT TREATING, INC.

4200 WEST VALLEY BOULEVARD

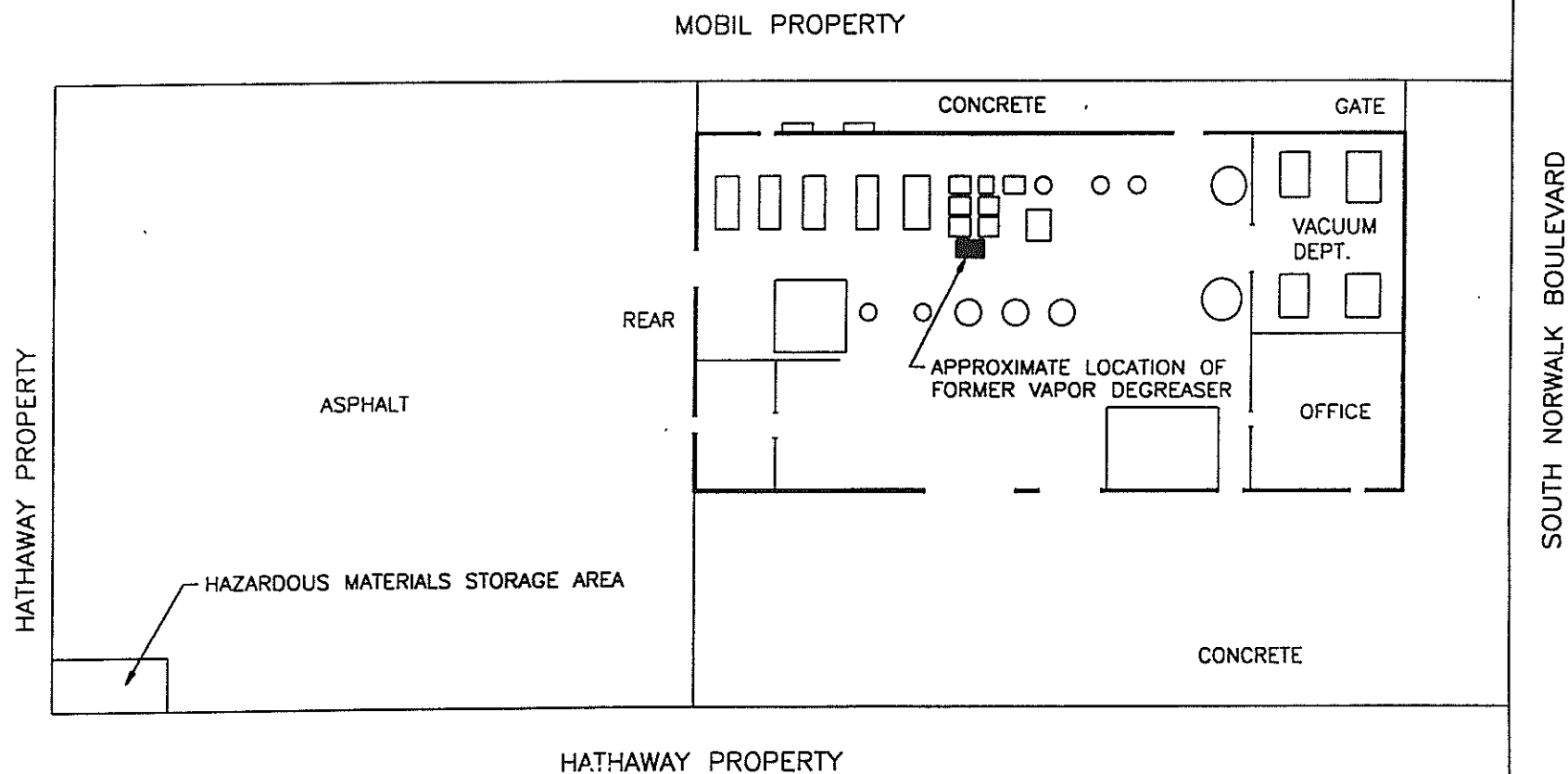
SANTA FE SPRINGS, CALIFORNIA

EST1315 / REMEDIAL INVESTIGATION WORK PLAN

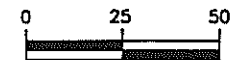
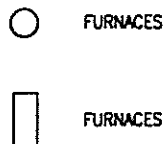
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NOT TO SCALE

DATE: 4-9-1996



EXPLANATION



APPROXIMATE SCALE IN FEET

FIGURE 2

SITE MAP

CONTINENTAL HEAT TREATING, INC.
 10643 SOUTH NORWALK BOULEVARD
 SANTA FE SPRINGS, CALIFORNIA
 EST1315 / REMEDIAL INVESTIGATION WORK PLAN
 DRAWN BY: JST SCALE: AS SHOWN DATE: 9-27-1996

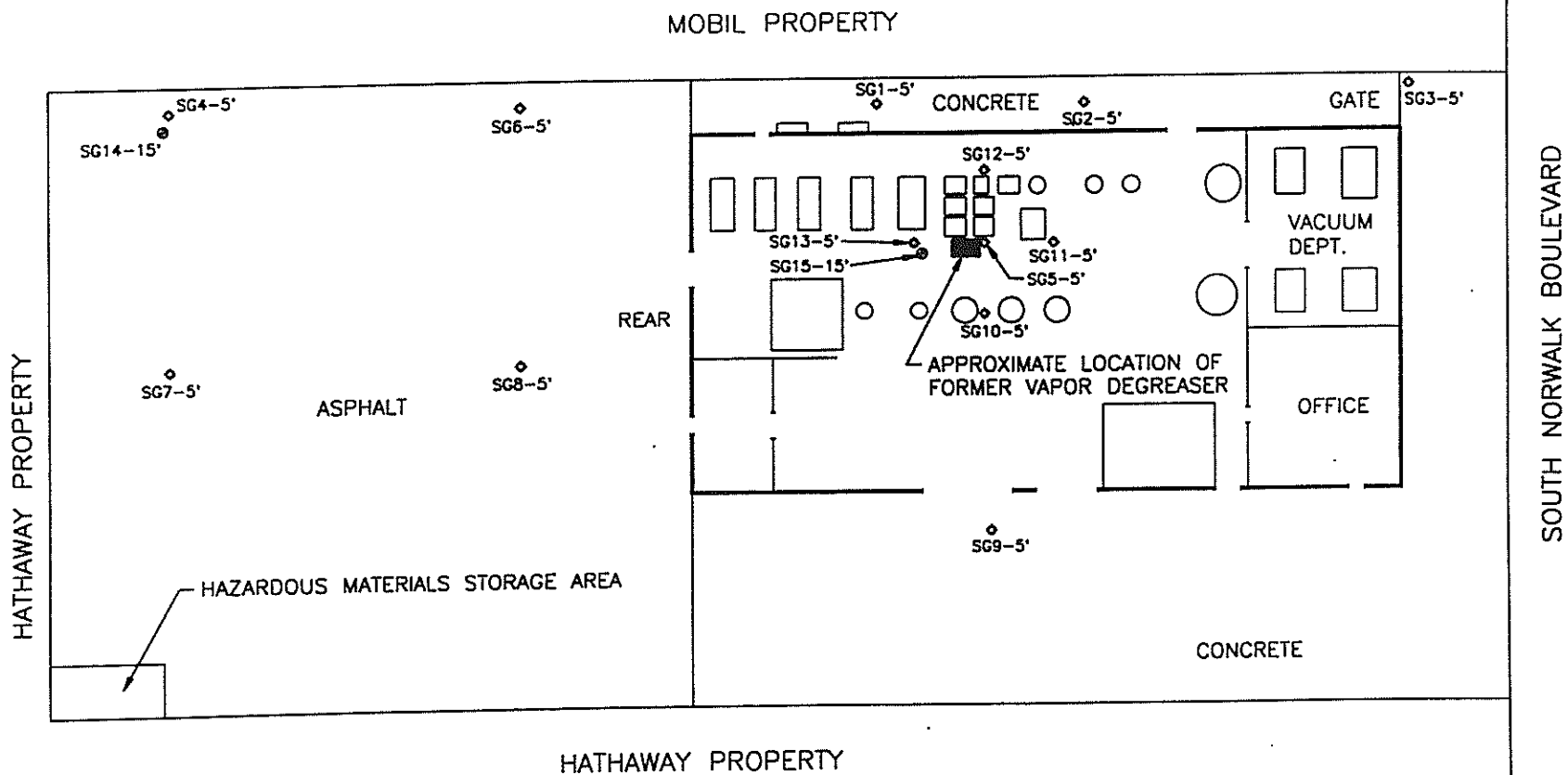
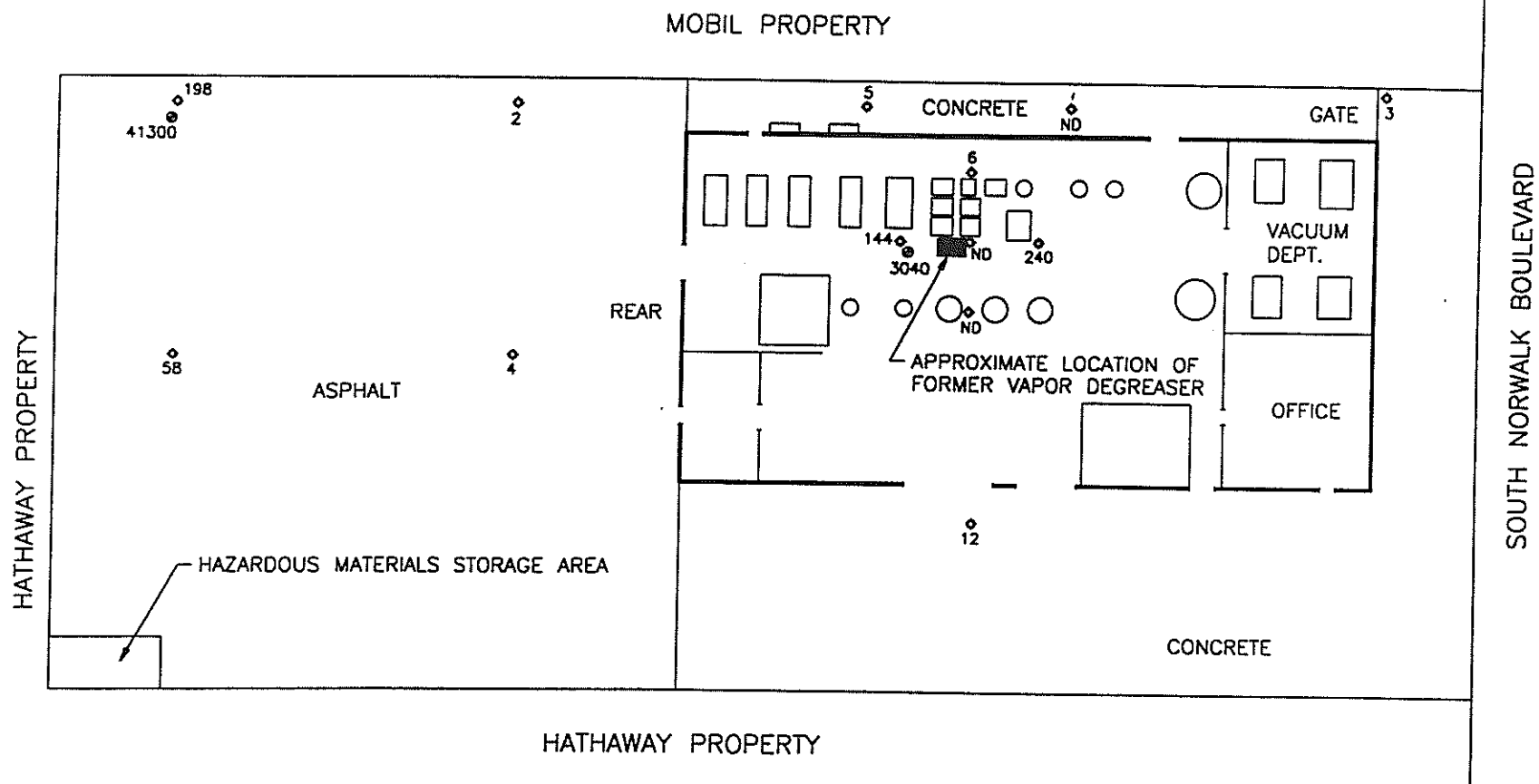


FIGURE 3
APPROXIMATE LOCATIONS OF
PREVIOUSLY INSTALLED SOIL GAS SAMPLING PROBES

CONTINENTAL HEAT TREATING, INC.
10643 SOUTH NORWALK BOULEVARD
SANTA FE SPRINGS, CALIFORNIA
EST1315 / REMEDIAL INVESTIGATION WORK PLAN
DRAWN BY: JST SCALE: AS SHOWN DATE: 9-27-1996



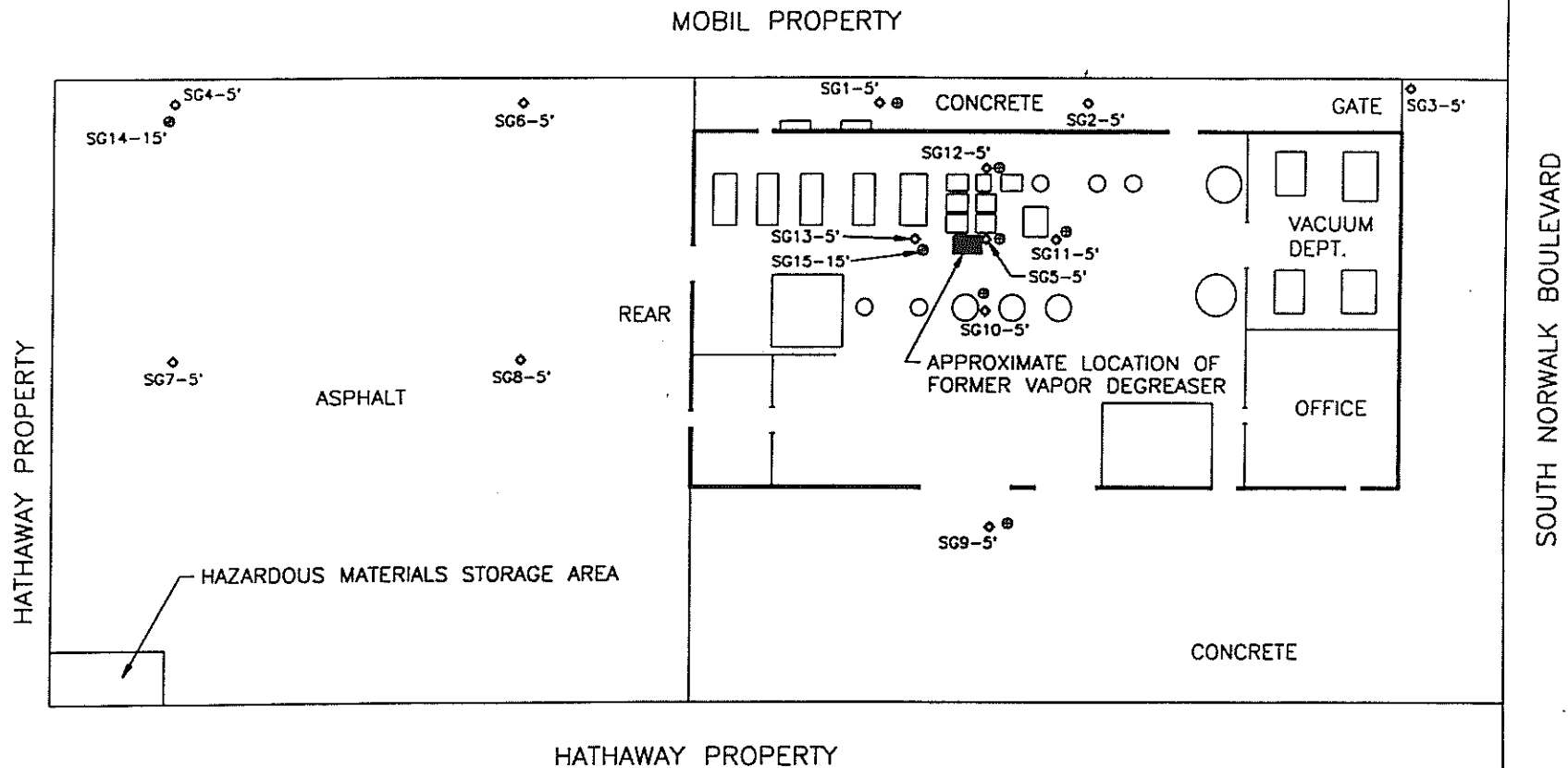
EXPLANATION

- 5 36
- APPROXIMATE LOCATION OF A 5-FOOT OR 15-FOOT SOIL GAS SAMPLING PROBE WITH DETECTED CONTRATIONS OF TETRACHLOROETHENE (PCE) ($\mu\text{g/L}$)
- ND = NOT DETECTED, SAMPLE BELOW DETECTION LIMITS








APPROXIMATE SCALE IN FEET

FIGURE 4
 DETECTED CONCENTRATIONS OF
 TETRACHLOROETHENE IN
 PREVIOUSLY INSTALLED SOIL GAS SAMPLING PROBES
 CONTINENTAL HEAT TREATING, INC.
 10643 SOUTH NORWALK BOULEVARD
 SANTA FE SPRINGS, CALIFORNIA
 EST1315 / REMEDIAL INVESTIGATION WORK PLAN
 DRAWN BY: JST SCALE: AS SHOWN DATE: 9-27-1996



EXPLANATION

- 
 SG1-5' APPROXIMATE LOCATION OF A PREVIOUSLY INSTALLED 5-FOOT SOIL GAS SAMPLING PROBE WITH ASSOCIATED PROBE NUMBER AND PROBE DEPTH
- 
 SG15-15' APPROXIMATE LOCATION OF A PREVIOUSLY INSTALLED 15-FOOT SOIL GAS SAMPLING PROBE WITH ASSOCIATED PROBE NUMBER AND PROBE DEPTH
- 
 APPROXIMATE LOCATION OF A PROPOSED REMEDIAL INVESTIGATION PHASE 2, 15-FOOT SOIL GAS SAMPLING PROBE
- 
 FURNACES
- 
 FURNACES

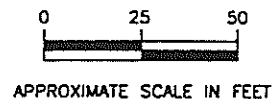


FIGURE 5
 APPROXIMATE LOCATIONS OF PROPOSED REMEDIAL INVESTIGATION PHASE 2, 15-FOOT, SOIL GAS SAMPLING PROBES
 CONTINENTAL HEAT TREATING, INC.
 10643 SOUTH NORWALK BOULEVARD
 SANTA FE SPRINGS, CALIFORNIA
 EST1315 / REMEDIAL INVESTIGATION WORK PLAN
 DRAWN BY: JST SCALE: AS SHOWN DATE: 9-27-1996



**MULTI-DEPTH
SOIL GAS SURVEY REPORT**

**CONTINENTAL HEAT TREATING
10643 SOUTH NORWALK BOULEVARD
SANTA FE SPRINGS, CALIFORNIA**

Prepared for:

**Continental Heat Treating
10643 South Norwalk Boulevard
Santa Fe Springs, California 90670**

Prepared by:

**Environmental Support Technologies, Inc.
23011 Moulton Parkway
Suite E-6
Laguna Hills, California 92653**

Project No. EST1315

May 8, 1996

LIMITATIONS AND WARRANTIES

This Multi-Depth Soil Gas Survey Report has been prepared for the exclusive use of Continental Heat Treating and assigned interested parties. The report has been prepared in accordance with generally accepted environmental assessment practices. No other warranty, expressed or implied, is made.

The information provided in this report is based on measurements performed in specific areas during a specific limited period of time. In the event that any changes occur in waste management practices, site conditions, or uses of the property, the conclusions and recommendations contained in this Multi-Depth Soil Gas Survey Report should be reviewed and modified or verified in writing by Environmental Support Technologies, Inc. (EST).

There is no investigation which is thorough enough to absolutely exclude the presence of hazardous material at the project site. Therefore, if none are identified as part of a limited investigation, such a conclusion should not be construed as a guaranteed absence of such materials, but merely the results of an investigation. EST, despite the use of reasonable care and a commitment to professional excellence, may not identify the presence of hazardous materials and hazardous compound concentrations in soil, soil gas, and/or groundwater. EST assumes no responsibility for conditions not investigated or for conditions not generally recognized as environmentally unacceptable, at the time of the investigation.

Kirk A. Thomson

Kirk A. Thomson, R.G., R.E.A.
Project Manager/Principal Hydrogeologist

1.0 INTRODUCTION

On May 2, 1996, Environmental Support Technologies, Inc. (EST), at the request of Continental Heat Treating (CHT), performed a multi-depth soil gas survey at the CHT site located at 10643 Norwalk Boulevard in Santa Fe Springs, California. The multi-depth soil gas survey included the installation of fifteen (15) soil gas sampling probes, including thirteen (13) 5-foot probes and two (2) 15-foot probes. Soil gas samples were collected and analyzed on-site for volatile organic compounds (VOCs) including halogenated and aromatic hydrocarbons. The multi-depth soil gas survey was performed based on requirements put forth by the County of Los Angeles Fire Department, Site Mitigation Unit, Health Hazardous Materials Division (LACFD). This Multi-Depth Soil Gas Survey Report was prepared based on soil gas sample analyses data collected during the survey.

2.0 OBJECTIVES OF THE SOIL GAS SURVEY

The objectives of the soil gas survey were to:

- Aid in identifying potential vadose zone source areas of VOCs including halogenated and aromatic hydrocarbons.
- Assess the lateral and limited vertical extent of VOCs in surficial soils.

Soil gas sampling is a monitoring technique for the presence of VOCs in soil and should be used in conjunction with other site-specific data. Soil gas sampling is limited its applications depending on site conditions. Some factors affecting the distribution of VOCs in the subsurface are listed in Appendix A.

3.0 RATIONALE FOR THE LOCATIONS OF SAMPLING SITES

The approximate locations of soil gas sampling probes are shown in Figure 1. The locations of soil gas probes were selected based on previous soil sampling data (Green Environmental, Inc., February 6, 1995) and conversations with Mr. George Baker of the LACFD. Probes were located in the vicinity of a former above-ground vapor degreaser and along the northern perimeter of the site.

4.0 METHODS AND PROCEDURES

The soil gas survey was performed in general accordance with Los Angeles Regional Water Quality Control Board's (LARWQCB) "Requirements for Active Soil Gas Investigation" dated March, 1994. George F. Baker of the LACFD informed EST personnel that the March, 1994 LARWQCB protocols for soil gas surveys are acceptable to the LACFD.

4.1 SOIL GAS PROBE INSTALLATION AND COMPLETION

Construction of a typical soil gas sampling probe is shown in Figure 2. Soil gas probes were installed using either a percussion-hammer or hydraulic-ram. Once a probe was installed to the desired depth, the hollow probe drive-rod was withdrawn, leaving the stainless steel probe point and NylaflowTM sampling tube in the sub-surface. Silica sand was poured around the probe tip to allow for diffusion of soil vapors. The remaining annulus was filled with hydrated bentonite/cement slurry to grade. The probe point and sampling tube assembly were left in place (dedicated) as a long-term soil gas monitoring point. The sampling tube was plugged with a stainless-steel machine-screw, folded over, and pushed down-hole until slightly below grade. The remaining depression was filled with concrete patch material and finished flush with surrounding paving material.

4.2 SOIL GAS SAMPLE COLLECTION AND HANDLING

Soil gas samples were collected using the soil gas sampling system shown in Figure 3. The soil gas sampling system was constructed of stainless-steel, glass, NylaflowTM, and TeflonTM components. Instrumentation associated with the sampling system included a calibrated flow-meter and vacuum gage. Vacuum integrity of the sampling system was tested prior to, and after the soil gas survey using leak-down testing methods. The soil gas sampling system and instrumentation were operating as required on both occasions. Soil gas sampling probes were purged at a flowrate of about 100 milliliters per minute (ml/min).

A site-specific probe purge volume versus sample concentration test was initially performed to evaluate the appropriate volume of gas to be purged from each probe prior to sample collection. Time-series sampling of at least one probe was conducted to evaluate trends in soil gas concentrations as a function of purge volume. After purging, soil gas samples were withdrawn from the sample stream using a glass syringe fitted with a disposable needle and MininertTM gas-tight valve. Soil gas samples were immediately injected into a gas chromatograph (GC) after collection.

4.3 SOIL GAS SAMPLE ANALYSES

Soil gas samples were analyzed in the field using a mobile laboratory equipped with a VarianTM-3400 GC configured with a photo-ionization detector (PID) and an electrolytic conductivity detector (ELCD) placed in series. The GC-PID/ELCD was used to analyze soil gas samples using a method similar to EPA Method 8010/8020. The detection limits for 8010/8020 compound analyses were one microgram per liter ($\mu\text{g/L}$).

4.4 INITIAL MULTI-POINT EQUIPMENT CALIBRATION

A summary of the Quality Assurance/Quality Control (QA/QC) analyses is presented in Table 1. The GC-PID/ELCD used for soil gas analyses was calibrated using high-purity solvent-based standards obtained from certified vendors. GC-PID/ELCD calibration standards were prepared in high-purity methanol solvent. GC-PID/ELCD calibration

using solvent-based standards was performed using varying injection volumes of the undiluted solvent-based standard. If necessary, stock solvent-based standards were diluted to an appropriate concentration. Diluted standards were prepared by introducing a known volume of stock solvent-based standard into a known volume of high-purity solvent.

Initial calibration was performed for 25 target compounds. The GC-PID/ELCD was calibrated using three standard injections to establish a three-point calibration curve. The lowest standard was not higher than five times the method detection limit (or 5 $\mu\text{g/L}$). The percent relative standard deviation (%RSD) of the response factor (RF) for each target compound did not exceed 20 percent except for trichlorofluoromethane (FreonTM-11), dichlorodifluoromethane (FreonTM-12), 1,1,2-trichloro-trifluoroethane (FreonTM-113), chloroethane (CE), and vinyl chloride (VC), which did not exceed 30 %RSD. Identification and quantitation of compounds in the field was based on calibration under the same analytical conditions as for three-point calibration.

4.5 LABORATORY CONTROL SAMPLE

A laboratory control sample (LCS) from a different source or lot number other than the initial calibration standard was used to verify the true concentration of the initial calibration standard. The LCS included LARWQCB target compounds, and the RF for each compound was within 15 percent of the initial calibration.

4.6 DAILY MID-POINT CALIBRATION CHECK

Daily field calibration of the GC-PID/ELCD consisted of a mid-point calibration using a standard containing 14 target compounds. The daily mid-point calibration check included the 12 target compounds specified in LARWQCB requirements dated March 1994. The RF of each compound (except for FreonTM -11, -12, and -113, CE, and VC) was within 15 percent of the average RF from the initial calibration. The RF for FreonTM -11, -12, and -113, CE, and VC were within 25 percent of the initial calibration. If these criteria were not met, the GC-PID/ELCD was recalibrated. Daily calibration was performed prior to the first soil gas sample analysis of the day. One-point calibration was performed for all compounds detected at the site to ensure accurate quantitation. Subsequent calibration episodes, if deemed necessary, consisted of at least one injection of the standard exhibiting a similar detector response as that of samples encountered in the field.

4.7 BLANK INJECTIONS

The syringes used for soil gas sample collection were periodically filled with ambient air or high-purity carrier-grade gas from a compressed gas cylinder. The ambient air or high-purity gas was injected directly into the gas chromatograph. The blank injections served to detect potential cross-contamination of the sampling equipment and to verify the effectiveness of decontamination procedures.

4.8 END OF DAY GC TEST RUN

A LCS was analyzed at the end of each field day. The LCS contained the same compounds as the daily mid-point calibration standard (minimum of 12 compounds). The LCS was procured from a source other than the initial multi-point calibration standard. The RF for each LCS compound was within 20 percent of the average RF for the initial calibration. If these criteria were not met, additional LCSs were analyzed.

4.9 DECONTAMINATION PROCEDURES

Probe installation and sampling equipment in contact with site soil or soil gas sample streams were decontaminated prior to collection of each soil gas sample. Decontamination of probe installation equipment was performed by immersion and scrubbing in Alconox™ detergent solution, rinsing in tap-water, rinsing in VOC-free water, followed by air drying. Decontamination of soil gas sampling equipment was performed by baking at elevated temperatures (<160° Celsius) inside the GC oven.

4.10 REPORTING OF SAMPLE RESULTS AND QA/QC INFORMATION

Reporting of sample analyses results and QA/QC information is in general accordance with the Los Angeles Regional Water Quality Control Board's "QA/QC and Reporting Requirements for Soil Gas Investigation" dated March 1994.

5.0 SOIL GAS SURVEY RESULTS

Soil gas samples collected at the site contained concentrations of vinyl chloride (VC), 1,1-dichloroethene (DCE), trans-1,2-dichloroethene, (T-DCE), cis-1,2-dichloroethene (C-DCE), chloroform (CFM), trichloroethene (TCE), tetrachloroethene (PCE), ethylbenzene (EBENZ), meta- and para-xylene (M+P-XYL), and ortho-xylene (O-XYL). A summary of field analyses results is provided in Table 2. Detected concentrations of PCE in soil gas samples are shown in Figure 4. Field analyses reports for soil gas samples, GC-PID/ELCD calibration data, and method detection limits are provided in Appendix B.

5.1 VINYL CHLORIDE (VC)

Concentrations of VC were detected in 3 of 15 sampled soil gas probes. Detected concentrations of VC ranged from 4 µg/L in Probe SG11-5 to 211 µg/L in Probe SG15-15.

5.2 1,1-DICHLOROETHENE (DCE)

Concentrations of DCE were detected in 2 of 15 sampled soil gas probes. Concentrations of 7 µg/L and 17 µg/L of DCE were detected in Probes SG13-5 and SG15-15, respectively.

5.3 TRANS-1,2-DICHLOROETHENE (T-DCE)

Concentrations of T-DCE were detected in 3 of 15 sampled soil gas probes. Detected concentrations of T-DCE ranged from 9 $\mu\text{g/L}$ in Probe SG9-5 to 174 $\mu\text{g/L}$ in Probe SG13-5.

5.4 CIS-1,2-DICHLOROETHENE (C-DCE)

Concentrations of C-DCE were detected in 7 of 15 sampled soil gas probes. Detected concentrations of C-DCE ranged from 3 $\mu\text{g/L}$ in Probe SG12-5 to 756 $\mu\text{g/L}$ in Probe SG13-5.

5.5 CHLOROFORM (CFM)

A concentration of 1 $\mu\text{g/L}$ of CFM was detected in a soil gas sample collected from Probe SG14-15.

5.6 TRICHLOROETHENE (TCE)

Concentrations of TCE were detected in 7 of 15 sampled soil gas probes. Detected concentrations of TCE ranged from 3 $\mu\text{g/L}$ in Probe SG12-5 to 246 $\mu\text{g/L}$ in Probe SG13-5.

5.7 TETRACHLOROETHENE (PCE)

Concentrations of PCE were detected in 12 of 15 sampled soil gas probes. Detected concentrations of PCE ranged from 2 $\mu\text{g/L}$ in Probe SG6-5 to 41,300 $\mu\text{g/L}$ in Probe SG14-15.

5.8 ETHYLBENZENE (EBENZ)

Concentrations of EBENZ were detected in 3 of 15 sampled soil gas probes. Detected concentrations of EBENZ ranged from 3 $\mu\text{g/L}$ in Probe SG11-5 to 36 $\mu\text{g/L}$ in Probe SG15-15.

5.9 META- and PARA-XYLENE (M+P-XYL)

Concentrations of M+P-XYL were detected in 3 of 15 sampled soil gas probes. Detected concentrations of M+P-XYL ranged from 3 $\mu\text{g/L}$ in Probe SG11-5 to 24 $\mu\text{g/L}$ in Probe SG15-15.

5.10 ORTHO-XYLENE (O-XYL)

Concentrations of O-XYL were detected in 3 of 15 sampled soil gas probes. Detected concentrations of O-XYL ranged from 3 $\mu\text{g/L}$ in Probe SG11-5 to 21 $\mu\text{g/L}$ in Probe SG15-15.

TABLES

TABLE 1
SUMMARY OF
QUALITY ASSURANCE/QUALITY CONTROL ANALYSES
FOR SOIL GAS SURVEYS

CALIBRATION AND LABORATORY CONTROL SAMPLES		
DESCRIPTION	FREQUENCY	PRECISION GOAL %RSD or %DIFF
INITIAL THREE-POINT CALIBRATION (25 Target Compounds)	At the beginning of the soil gas survey, unless the RPDs of the initial laboratory check sample or daily mid-point calibration check samples exceed their goals.	20-30 (1)
INITIAL LABORATORY CONTROL SAMPLE (LCS) (25 Target Compounds)	At the beginning of the survey, following the initial three-point calibration.	15 (2)
DAILY MID-POINT CALIBRATION CHECK (12 Target Compounds)	At the beginning of each day.	15 (3) 25 (3)
LAST GC TEST RUN (12 Target Compounds)	At the end of each day.	20 (4)
FIELD CONTROL SAMPLES		
DESCRIPTION	FREQUENCY	PRECISION GOAL
BACKGROUND SAMPLE (5)	Minimum one per day.	N/A
SYRINGE BLANK (5)	Minimum one per day.	N/A

%RSD = Percent Relative Standard Deviation calculated based on the initial three-point calibration.

%DIFF = Percent Difference between the response factor obtained from the LCS, the daily mid-point calibration, or the last GC test run and the average response factor initially calculated based on the three-point calibration.

N/A = Not applicable.

(1) The %RSD goal for the initial three-point calibration will be 20 percent for all compounds except for Freon 11, Freon 12, Freon 113, chloroethane, and vinyl chloride for which the %RSD goal is 30 percent.

(2) The %DIFF goal for the LCS will be 15 percent for all target compounds.

(3) The %DIFF goal for the daily mid-point calibration check will be 15 percent for all compounds except for Freon 11, Freon 12, Freon 113, chloroethane, and vinyl chloride for which the %DIFF goal is 25 percent.

(4) The %DIFF goal for the last GC test run will be 20 percent for all compounds except for Freon 11, Freon 12, Freon 113, chloroethane, and vinyl chloride for which the %DIFF goal is 30 percent.

(5) A syringe/background sample will be analyzed using ambient air. If volatile organic compounds (VOCs) are not detected, the ambient air sample will represent the background sample and syringe blank. If VOCs are detected in the ambient air sample, a syringe blank will be analyzed using ultra-high-purity helium or nitrogen gas.

0506/96

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TABLE 2

SUMMARY OF FIELD ANALYSES RESULTS FOR SOIL GAS SAMPLES

CONTINENTAL HEAT TREATING SITE
10643 SOUTH NORWALK BOULEVARD
SANTA FE SPRINGS, CALIFORNIA

PROBE NUMBER	DATE OF SAMPLING	PROBE DEPTH (ft)	SAMPLING EVENTS	VC (ug/L)	DCE (ug/L)	T-DCE (ug/L)	C-DCE (ug/L)	CFM (ug/L)	TCE (ug/L)	PCE (ug/L)	EBENZ (ug/L)	M+P-XYL (ug/L)	O-XYL (ug/L)
SG1-5	5/2/96	5'	3	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	5	ND<1	ND<1	ND<1
SG2-5	5/2/96	5'	1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1
SG3-5	5/2/96	5'	1	ND<1	ND<1	ND<1	6	ND<1	5	3	ND<1	ND<1	ND<1
SG4-5	5/2/96	5'	2	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	198	ND<1	ND<1	ND<1
SG5-5	5/2/96	5'	1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1
SG6-5	5/2/96	5'	1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	2	ND<1	ND<1	ND<1
SG7-5	5/2/96	5'	2	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	58	ND<1	ND<1	ND<1
SG8-5	5/2/96	5'	1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	4	ND<1	ND<1	ND<1
SG9-5	5/2/96	5'	2	ND<1	ND<1	9	35	ND<1	14	12	ND<1	ND<1	ND<1
SG10-5	5/2/96	5'	1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1
SG11-5	5/2/96	5'	2	4	ND<1	ND<1	71	ND<1	88	240	3	3	3
SG12-5	5/2/96	5'	1	ND<1	ND<1	ND<1	3	ND<1	3	6	ND<1	ND<1	ND<1
SG13-5	5/2/96	5'	4	74	7	174	756	ND<1	246	144	5	7	4
SG14-15	5/2/96	15'	3	ND<1	ND<1	ND<1	6	1	30	41,300	ND<1	ND<1	ND<1
SG15-15	5/2/96	15'	4	211	17	114	269	ND<1	225	3,040	36	24	21

ft. = feet below grade

ug/L = micrograms per liter

ND = Not Detected; sample is below the reported detection limit

VC = Vinyl Chloride

DCE = 1,1-Dichloroethene

T-DCE = trans-1,2-Dichloroethene

C-DCE = cis-1,2-Dichloroethene

CFM = Chloroform

TCE = Trichloroethene

PCE = Tetrachloroethene

EBENZ = Ethylbenzene

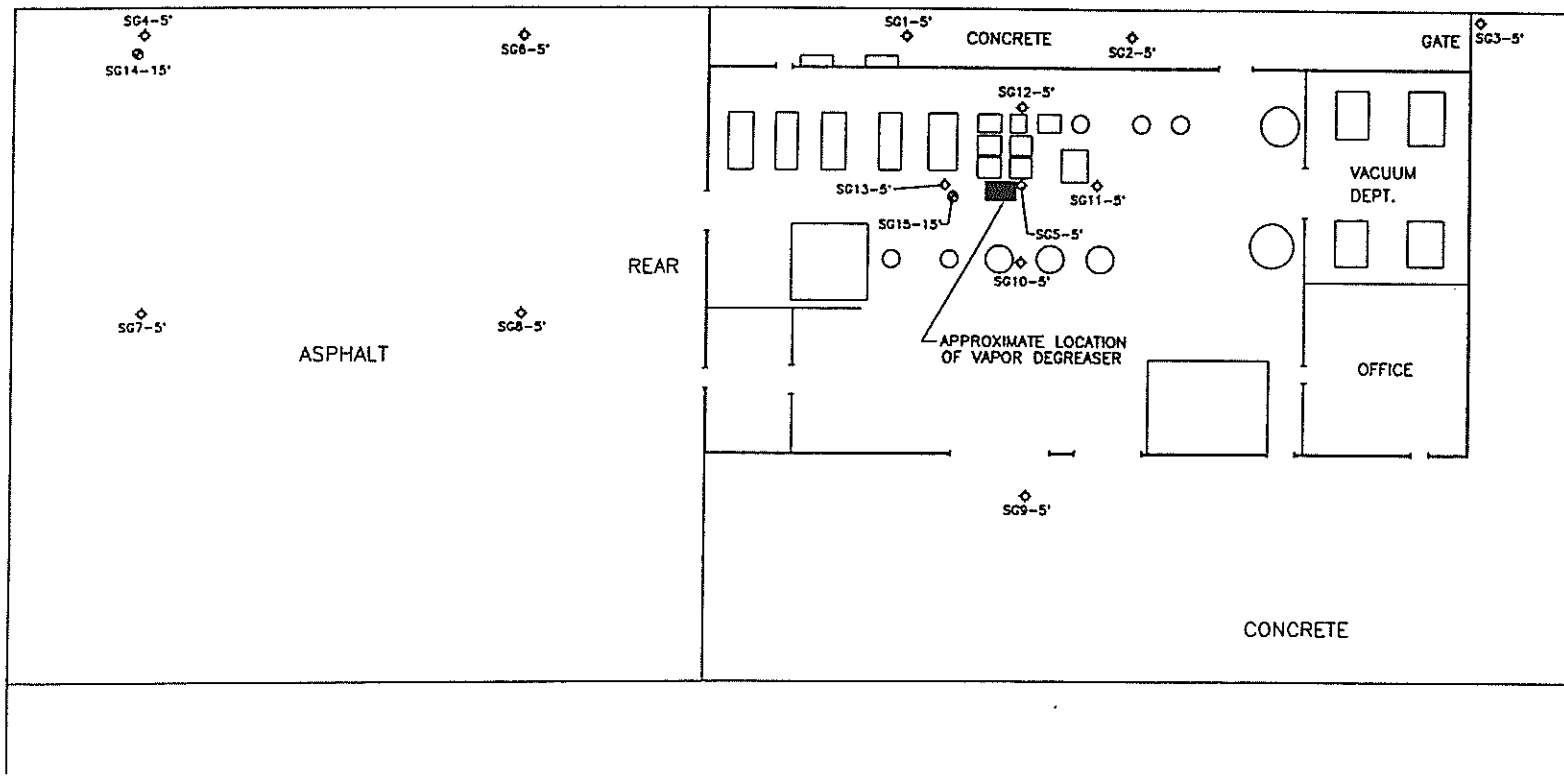
M+P-XYL

O-XYL = ortho-Xylene

NOTE: Values shown are the highest detected in each probe within calibration range.

FIGURES

MOBIL PROPERTY



SOUTH NORWALK BOULEVARD

EXPLANATION

- ◇ SG1-5' APPROXIMATE LOCATION OF A 5-FOOT SOIL GAS SAMPLING PROBE WITH ASSOCIATED PROBE NUMBER AND PROBE DEPTH
- ◊ SG15-15' APPROXIMATE LOCATION OF A 15-FOOT SOIL GAS SAMPLING PROBE WITH ASSOCIATED PROBE NUMBER AND PROBE DEPTH
- FURNACES
- FURNACES

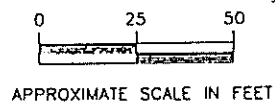


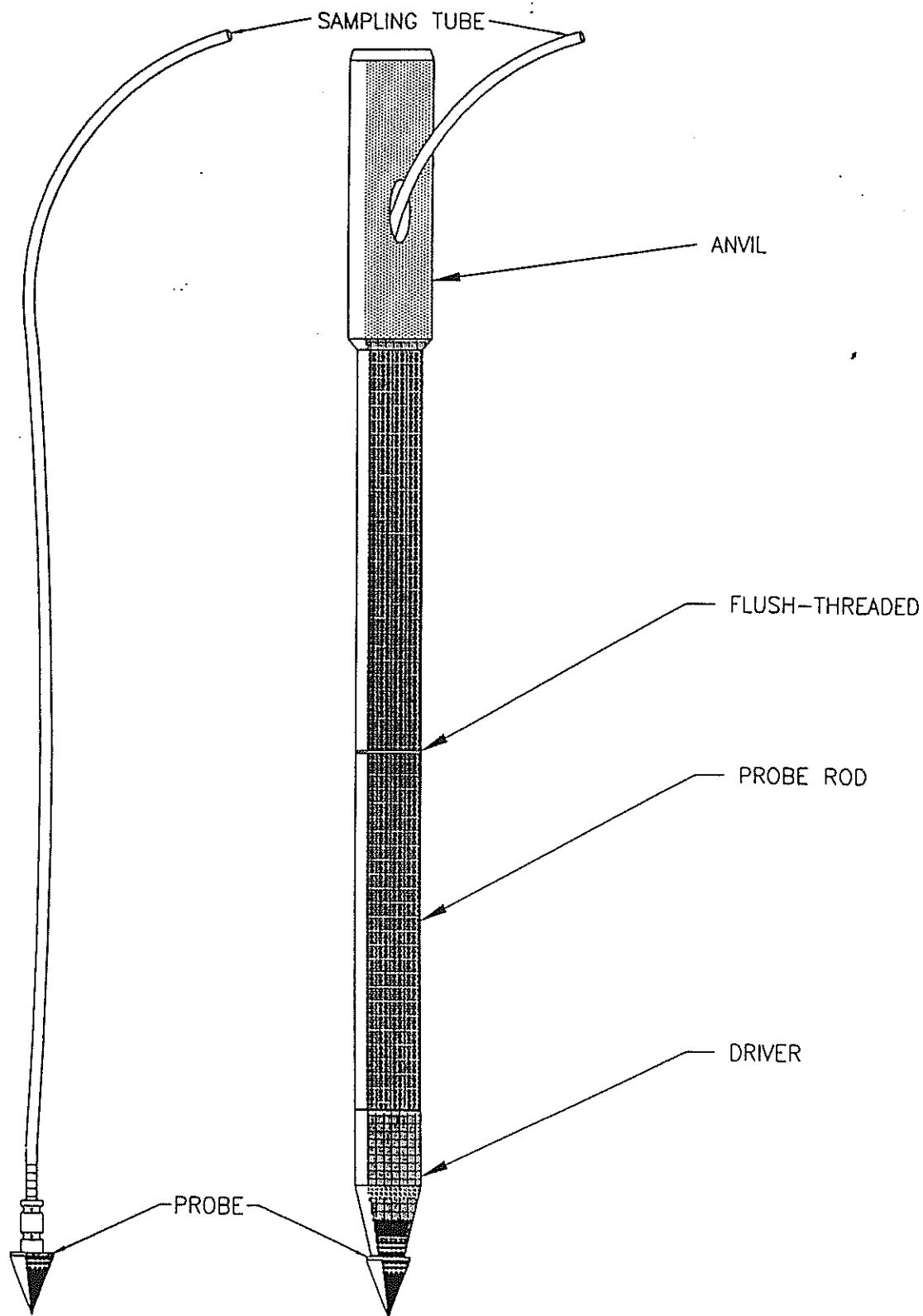
FIGURE 1

APPROXIMATE LOCATIONS OF
SOIL GAS SAMPLING PROBES
CONTINENTAL HEAT TREATING, INC.
10643 SOUTH NORWALK BOULEVARD
SANTA FE SPRINGS, CALIFORNIA
EST1315 / SOIL GAS SURVEY

DRAWN BY: JST

SCALE: AS SHOWN

DATE: 5-7-1996



DEDICATED PORTION OF PROBE

NOTE: NOT TO SCALE

FIGURE 2
SOIL GAS SAMPLING PROBE

CONTINENTAL HEAT TREATING, INC.
10643 SOUTH NORWALK BOULEVARD
SANTA FE SPRINGS, CALIFORNIA
EST1315 / SOIL GAS SURVEY

DRAWN BY: JST

SCALE: AS SHOWN

DATE: 5-7-1996

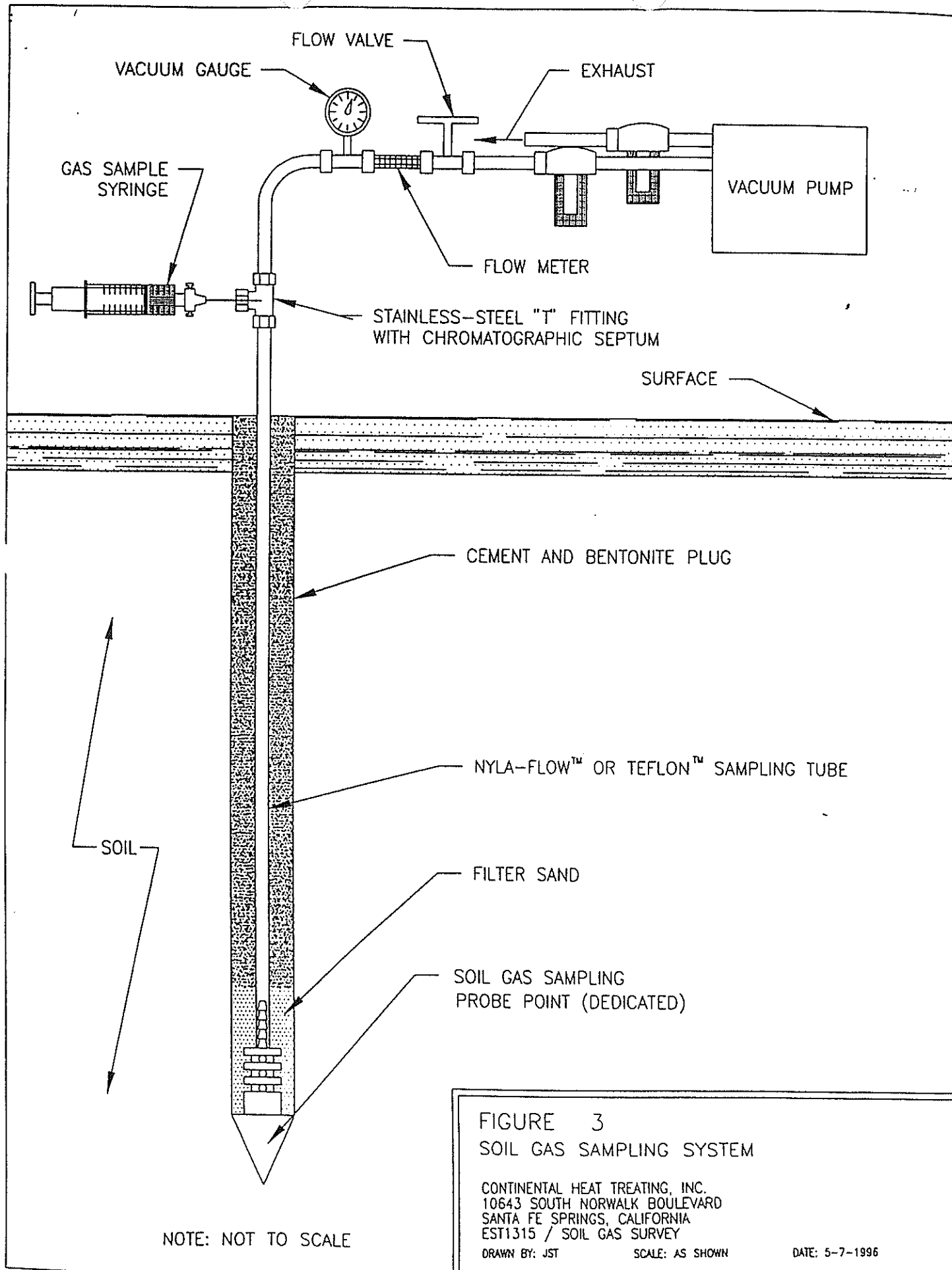


FIGURE 3
SOIL GAS SAMPLING SYSTEM

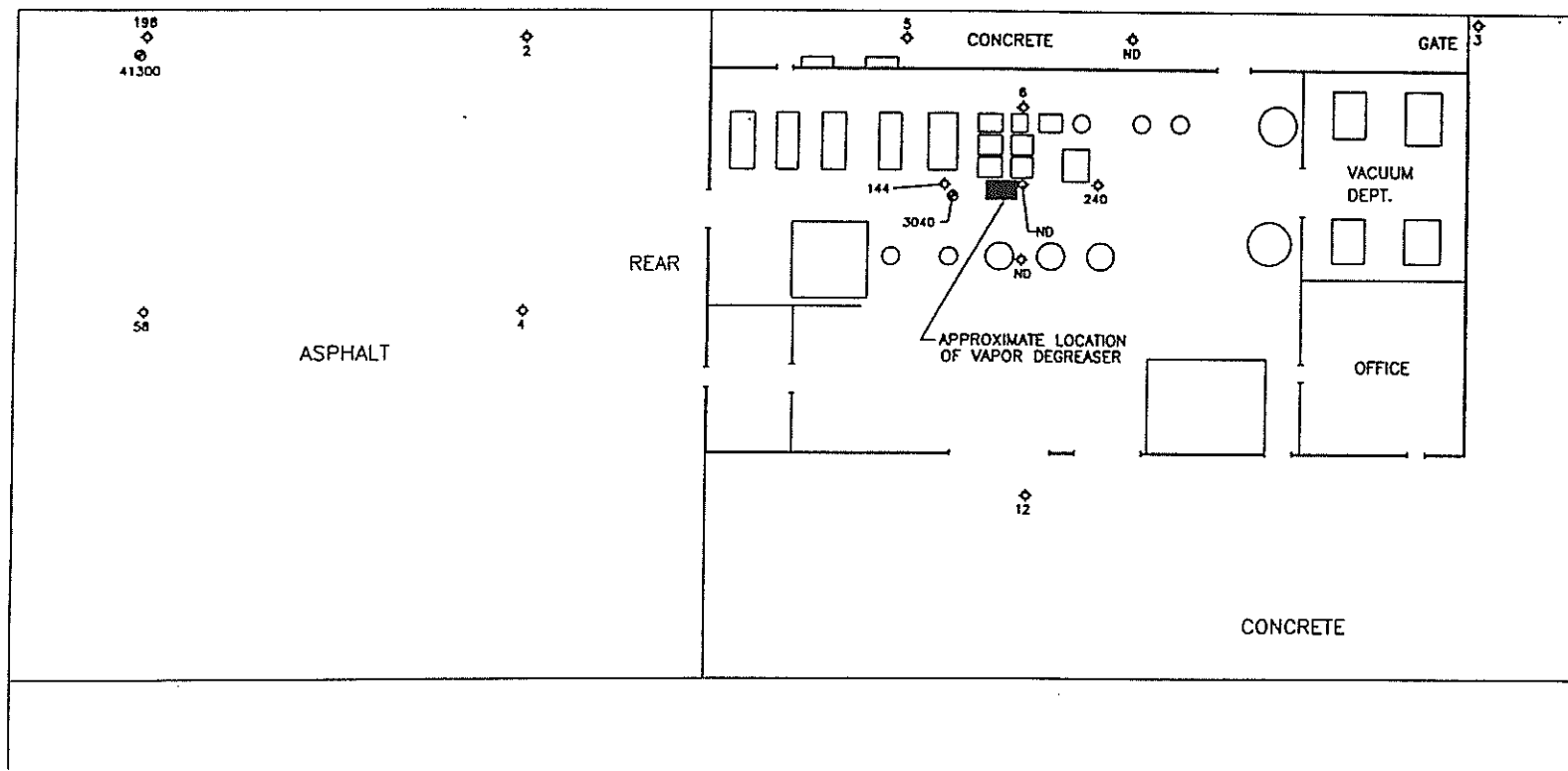
CONTINENTAL HEAT TREATING, INC.
10643 SOUTH NORWALK BOULEVARD
SANTA FE SPRINGS, CALIFORNIA
EST1315 / SOIL GAS SURVEY

DRAWN BY: JST

SCALE: AS SHOWN

DATE: 5-7-1996

MOBIL PROPERTY



SOUTH NORWALK BOULEVARD

EXPLANATION

◇ or ○ APPROXIMATE LOCATION OF A 5-FOOT OR 15-FOOT SOIL GAS SAMPLING PROBE WITH
 DETECTED CONTRACTIONS OF TETRACHLOROETHENE (PCE) (μ g/L)
 ND = NOT DETECTED

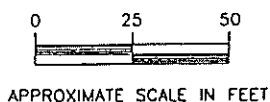


FIGURE 4
 DETECTED CONCENTRATIONS OF
 TETRACHLOROETHENE
 CONTINENTAL HEAT TREATING, INC.
 10643 SOUTH NORWALK BOULEVARD
 SANTA FE SPRINGS, CALIFORNIA
 EST1315 / SOIL GAS SURVEY

DRAWN BY: JST SCALE: AS SHOWN

DATE: 5-7-1996

APPENDICES

Appendix A

FACTORS AFFECTING THE GAS-PHASE DISTRIBUTION OF VOCs IN THE SUBSURFACE

FACTORS AFFECTING THE GAS-PHASE DISTRIBUTION OF VOCs IN THE SUBSURFACE

Soil and groundwater contamination by volatile organic compounds (VOCs) can often be detected by analyzing trace gases in soil just below ground surface. This technique is possible because many VOCs will volatilize and move by molecular diffusion away from source areas toward regions of lower concentrations. A gas phase concentration gradient from the source to adjacent areas is established.

The following factors affect the transport and gas phase distribution of VOCs in the subsurface.

1. The liquid-gas partitioning coefficient of the compounds of interest (the "volatility" of the compound).
2. The vapor diffusivity, which is a measure of how quickly an individual compound "spreads out" within a volume of gas.
3. Retardation of the individual compounds as they migrate in the soil gas. Retardation may be due to degradation, adsorption on the soil matrix, tortuosity of the soil profile, or entrapment in unconnected pores.
4. The presence of impeding layers, wetting fronts of freshwater, or perched water tables, between the regional water table and ground surface.
5. The presence of soil moisture around man-made structures such as clarifiers and sumps may suppress volatilization and diffusion of VOCs resulting in false negative or low soil gas concentrations.
6. The presence of contaminants from localized spills or in the ambient air.
7. Movement of soil gas in response to barometric pressure changes.
8. The preferential migration of gas through zones of greater permeability (e.g. natural lithologic variation or back-fill of underground utilities).
9. Soil temperature.

At most sites, many of these factors are unknown or poorly understood. Because of this uncertainty, soil gas sampling should be used in conjunction with other site-specific data.

Appendix B

**FIELD ANALYSES RESULTS FOR
AROMATIC AND HALOGENATED HYDROCARBONS**

**(INCLUDING CALIBRATION REPORTS, QUALITY CONTROL REPORTS,
AND EXPLANATION OF METHOD DETECTION LIMITS)**

TABLE B-1
HALOGENATED AND AROMATIC HYDROCARBONS
FIELD ANALYSES RESULTS FOR SOIL GAS SAMPLES
SITE LOCATED AT 10643 SOUTH NORWALK BOULEVARD, SANTA FE SPRINGS, CALIFORNIA
25-TARGET COMPOUND LIST

PID/ELGD #2 - 5/2/98
FILE: 315ASGRP.WY3

SAMPLE ID			SG1-5	SG1-5	SG1-5	SG2-5	SG7-5	SG7-5	SG4-5	SG4-5
DATE			5/2/98	5/2/98	5/2/98	5/2/98	5/2/98	5/2/98	5/2/98	5/2/98
TIME			8:51	9:08	9:21	9:35	9:50	10:06	10:22	10:38
INJECTION VOLUME (ul)			500	500	500	500	500	100	500	50
PURGE VOLUME (ml)			100	200	400	100	100	100	100	100
VACUUM (in. Hg)			ND	ND	ND	ND	ND	ND	ND	ND
DILUTION FACTOR			1.0	1.0	1.0	1.0	1.0	5.0	1.0	10.0
COMMENTS	RT	ARF								
Dichlorodifluoromethane	2:80	8.77E+07	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND
Vinylchloride	3:26	4.37E+08	0.00E+00 ND <1	0.00E+00 ND <1	0.00E+00 ND <1	0.00E+00 ND <1	0.00E+00 ND <1	0.00E+00 ND <5	0.00E+00 ND <1	0.00E+00 ND <10
Chloroethane	3:55	3.10E+08	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND
Trichlorofluoromethane	3:75	6.79E+08	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND
1,1,2-Trichloro-trifluoroethane	4:36	1.37E+09	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND
1,1-Dichloroethene	4:36	2.49E+07	0.00E+00 ND <1	0.00E+00 ND <1	0.00E+00 ND <1	0.00E+00 ND <1	0.00E+00 ND <1	0.00E+00 ND <5	0.00E+00 ND <1	0.00E+00 ND <10
Methylene chloride	4:83	1.07E+09	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND
trans-1,2-Dichloroethene	5:24	1.04E+08	0.00E+00 ND <1	0.00E+00 ND <1	0.00E+00 ND <1	0.00E+00 ND <1	0.00E+00 ND <1	0.00E+00 ND <5	0.00E+00 ND <1	0.00E+00 ND <10
1,1-Dichloroethane	5:72	9.38E+08	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND
cis-1,2-Dichloroethane	6:39	1.13E+09	0.00E+00 ND <1	0.00E+00 ND <1	0.00E+00 ND <1	0.00E+00 ND <1	0.00E+00 ND <1	0.00E+00 ND <5	0.00E+00 ND <1	0.00E+00 ND <10
Chloroform	6:75	1.31E+09	0.00E+00 ND <1	0.00E+00 ND <1	0.00E+00 ND <1	0.00E+00 ND <1	0.00E+00 ND <1	0.00E+00 ND <5	0.00E+00 ND <1	0.00E+00 ND <10
1,1,1-Trichloroethane	7:01	1.18E+09	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND
Carbon tetrachloride	7:22	1.48E+09	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND
Benzene	7:48	9.07E+07	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND
1,2-Dichloroethane	7:47	1.32E+09	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND
Trichloroethene	8:26	1.19E+08	0.00E+00 ND <1	0.00E+00 ND <1	0.00E+00 ND <1	0.00E+00 ND <1	0.00E+00 ND <1	0.00E+00 ND <5	0.00E+00 ND <1	0.00E+00 ND <10
Toluene	10:04	8.74E+07	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND
1,1,2-Trichloroethane	10:82	9.68E+08	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND
Tetrachloroethene	10:81	1.43E+09	3.58E+08 5	2.44E+08 3	2.48E+08 3	0.00E+00 ND <1	3.25E+07 48 *	8.28E+08 58	4.37E+07 81 *	1.41E+07 198
1,1,1,2-Tetrachloroethane	12:36	1.12E+09	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND
Ethylbenzene	12:40	6.04E+07	0.00E+00 ND <1	0.00E+00 ND <1	0.00E+00 ND <1	0.00E+00 ND <1	0.00E+00 ND <1	0.00E+00 ND <5	0.00E+00 ND <1	0.00E+00 ND <10
meta and para-Xylene	12:58	1.66E+08	0.00E+00 ND <1	0.00E+00 ND <1	0.00E+00 ND <1	0.00E+00 ND <1	0.00E+00 ND <1	0.00E+00 ND <5	0.00E+00 ND <1	0.00E+00 ND <10
ortho-Xylene	13:26	6.32E+07	0.00E+00 ND <1	0.00E+00 ND <1	0.00E+00 ND <1	0.00E+00 ND <1	0.00E+00 ND <1	0.00E+00 ND <5	0.00E+00 ND <1	0.00E+00 ND <10
1,1,2,2-Tetrachloroethane	14:34	8.66E+08	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND

ND = not detected; analyte is below the reportable limit of quantitation for this sample
RT = retention time
ul = microliter
In. Hg = Inches of Mercury

Concentrations reported in micrograms per liter (ug/L)
ARF = average response factor
ml = milliliter
* = compound detected out of calibration range

5/2/98

ANALYST : Ragl Abraham

1.

REVIEWED BY : David M. Pride

(15)

TABLE B-1
HALOGENATED AND AROMATIC HYDROCARBONS
FIELD ANALYSES RESULTS FOR SOIL GAS SAMPLES
SITE LOCATED AT 10643 SOUTH NORWALK BOULEVARD, SANTA FE SPRINGS, CALIFORNIA
25-TARGET COMPOUND LIST

PID/ELOD #2 - 5/2/98
FILE: 315ASGRP.WK3

SAMPLE ID			SG8-5	SG9-5	SG5-5	SG10-5	SG11-5	SG11-5	SG12-5	SG13-5
DATE			5/2/98	5/2/98	5/2/98	5/2/98	5/2/98	5/2/98	5/2/98	5/2/98
TIME			10:54	11:09	11:29	11:45	12:01	12:19	12:37	12:53
INJECTION VOLUME (ul)			500	500	500	500	500	50	500	500
PURGE VOLUME (ml)			100	100	100	100	100	100	100	100
VACUUM (in. Hg)			ND	ND	ND	ND	ND	ND	ND	ND
DILUTION FACTOR			1.0	1.0	1.0	1.0	1.0	10.0	1.0	1.0
COMMENTS			RT	ARF						
Dichlorodifluoromethane	2:90	8.77E+07	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND
Vinyl chloride	3:26	4.37E+08	0.00E+00 ND <1	0.00E+00 ND <1	0.00E+00 ND <1	0.00E+00 ND <1	8.14E+05 4	0.00E+00 ND <10	0.00E+00 ND <1	2.01E+07 82 *
Chloroethane	3:55	3.10E+08	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND
Trichlorofluoromethane	3:75	6.79E+08	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND
1,1,2-Trichloro-trifluoroethane	4:36	1.37E+09	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND
1,1-Dichloroethane	4:36	2.49E+07	0.00E+00 ND <1	0.00E+00 ND <1	0.00E+00 ND <1	0.00E+00 ND <1	0.00E+00 ND <1	0.00E+00 ND <10	0.00E+00 ND <1	8.85E+04 7
Methylene chloride	4:93	1.07E+09	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND
trans-1,2-Dichloroethene	5:24	1.04E+09	0.00E+00 ND <1	0.00E+00 ND <1	0.00E+00 ND <1	0.00E+00 ND <1	0.00E+00 ND <1	0.00E+00 ND <10	0.00E+00 ND <1	3.85E+07 74 *
1,1-Dichloroethane	5:72	9.38E+08	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND
cis-1,2-Dichloroethene	6:39	1.13E+08	5.13E+05 ND <1	0.00E+00 ND <1	0.00E+00 ND <1	0.00E+00 ND <1	2.83E+07 47 *	3.97E+08 71	1.87E+08 3	6.44E+07 114 *
Chloroform	6:75	1.31E+09	0.00E+00 ND <1	0.00E+00 ND <1	0.00E+00 ND <1	0.00E+00 ND <1	0.00E+00 ND <1	0.00E+00 ND <10	0.00E+00 ND <1	0.00E+00 ND <1
1,1,1-Trichloroethane	7:01	1.18E+09	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND
Carbon tetrachloride	7:22	1.48E+09	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND
Benzene	7:46	9.07E+07	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND
1,2-Dichloroethane	7:47	1.32E+09	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND
Trichloroethene	8:28	1.19E+09	3.13E+05 ND <1	0.00E+00 ND <1	0.00E+00 ND <1	0.00E+00 ND <1	2.98E+07 50 *	5.26E+08 88	1.67E+08 3	4.50E+07 78 *
Toluene	10:04	6.74E+07	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND
1,1,2-Trichloroethane	10:52	9.88E+08	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND
Tetrachloroethene	10:51	1.43E+09	3.09E+08 4	1.51E+08 2	2.23E+05 ND <1	2.88E+05 ND <1	4.59E+07 64 *	1.72E+07 240	4.44E+08 8	4.23E+07 59 *
1,1,1,2-Tetrachloroethane	12:36	1.12E+09	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND
Ethylbenzene	12:40	8.04E+07	0.00E+00 ND <1	0.00E+00 ND <1	0.00E+00 ND <1	0.00E+00 ND <1	9.79E+04 3	8.01E+03 ND <10	0.00E+00 ND <1	1.59E+05 5
meta and para-Xylene	12:59	1.69E+08	0.00E+00 ND <1	0.00E+00 ND <1	0.00E+00 ND <1	0.00E+00 ND <1	2.75E+05 3	1.51E+04 ND <10	0.00E+00 ND <1	6.23E+05 7
ortho-Xylene	13:26	8.32E+07	0.00E+00 ND <1	0.00E+00 ND <1	0.00E+00 ND <1	0.00E+00 ND <1	9.16E+04 3	0.00E+00 ND <10	0.00E+00 ND <1	1.13E+05 4
1,1,2,2-Tetrachloroethane	14:34	8.88E+08	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND

ND = not detected; analyte is below the reportable limit of quantitation for this sample
RT = retention time
ul = microliter
in. Hg = inches of Mercury

Concentrations reported in micrograms per liter (ug/L)
ARF = average response factor
ml = milliliter
* = compound detected out of calibration range

5/2/98

ANALYST : Regi Abraham

2.

REVIEWED BY : David M. Pride

TABLE B-1
HALOGENATED AND AROMATIC HYDROCARBONS
FIELD ANALYSES RESULTS FOR SOIL GAS SAMPLES
SITE LOCATED AT 10643 SOUTH NORWALK BOULEVARD, SANTA FE SPRINGS, CALIFORNIA
25-TARGET COMPOUND LIST

PID/ELCD #2 - 5/2/98
 FILE: 315ASGRP.WK3

SAMPLE ID			SG13-5	SG13-5	SG13-5	SG8-5	SG8-5	SG3-5	SG14-15	SG14-15
DATE			5/2/98	5/2/98	5/2/98	5/2/98	5/2/98	5/2/98	5/2/98	5/2/98
TIME			13:11	13:27	13:42	13:58	14:12	14:31	15:09	15:23
INJECTION VOLUME (ul)			50	25	10	500	100	500	500	250
PURGE VOLUME (ml)			100	100	100	100	100	100	170	170
VACUUM (in. Hg)			ND	ND	ND	ND	ND	ND	ND	ND
DILUTION FACTOR			10.0	20.0	50.0	1.0	5.0	1.0	1.0	160.0
COMMENTS			RT	ARF						Dilution 1:80
Dichlorodifluoromethane			2:80	8.77E+07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
					1.81E+08	7.77E+05	1.60E+05	1.48E+05	0.00E+00	0.00E+00
Vinyl chloride			3:28	4.37E+08	74	71	ND<50	ND<1	ND<5	ND<1
Chloroethane			3:55	3.10E+08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Trichlorofluoromethane			3:75	6.79E+08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,1,2-Trichloro-trifluoroethane			4:38	1.37E+09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
					8.20E+03	5.46E+03	2.57E+03	8.13E+03	3.69E+03	8.59E+03
1,1-Dichloroethane			4:36	2.49E+07	ND<10	ND<20	ND<50	ND<1	ND<5	ND<1
Methylene chloride			4:03	1.07E+09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
					9.04E+08	4.33E+08	1.03E+08	4.69E+08	1.99E+05	1.88E+05
trans-1,2-Dichloroethane			5:24	1.04E+09	174	187	99	9	ND<5	ND<1
1,1-Dichloroethane			5:72	9.38E+08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
					2.51E+07	1.95E+07	8.50E+08	2.51E+07	3.93E+08	3.38E+08
cis-1,2-Dichloroethane			6:39	1.13E+09	448 *	692 *	758	45 *	35	8
					0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.72E+05
Chloroform			6:75	1.91E+09	ND<10	ND<20	ND<50	ND<1	ND<5	ND<1
					0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.19E+05
1,1,1-Trichloroethane			7:01	1.18E+09	ND	ND	ND	ND	ND	ND<1
Carbon tetrachloride			7:22	1.48E+09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzene			7:46	9.07E+07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,2-Dichloroethane			7:47	1.32E+09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
					1.47E+07	7.11E+08	1.47E+08	8.52E+08	1.02E+08	3.19E+08
Trichloroethene			8:28	1.19E+08	246	239	124	14	9	5
					0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Toluene			10:04	8.74E+07	ND	ND	ND	ND	ND	ND
1,1,2-Trichloroethane			10:02	9.86E+08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
					1.03E+07	5.14E+08	8.95E+05	8.31E+08	1.52E+08	2.13E+08
Tetrachloroethene			10:01	1.43E+09	144	144	83	12	11	3
					0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,1,1,2-Tetrachloroethane			12:38	1.12E+09	ND	ND	ND	ND	ND	ND
					7.54E+03	0.00E+00	0.00E+00	4.94E+03	0.00E+00	0.00E+00
Ethylbenzene			12:40	8.04E+07	ND<10	ND<20	ND<50	ND<1	ND<5	ND<1
					2.37E+04	0.00E+00	0.00E+00	1.15E+04	0.00E+00	0.00E+00
meta and para-Xylene			12:58	1.69E+08	ND<10	ND<20	ND<50	ND<1	ND<5	ND<1
					0.00E+00	0.00E+00	0.00E+00	5.24E+03	0.00E+00	0.00E+00
ortho-Xylene			13:26	8.32E+07	ND<10	ND<20	ND<50	ND<1	ND<5	ND<1
					0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,1,2,2-Tetrachloroethane			14:34	8.86E+08	ND	ND	ND	ND	ND	ND

ND = not detected; analyte is below the reportable limit of quantitation for this sample
 RT = retention time
 ul = microliter
 in. Hg = inches of Mercury

Concentrations reported in micrograms per liter (ug/L)
 ARF = average response factor
 ml = milliliter
 * = compound detected out of calibration range

5/2/98

TABLE B-1
HALOGENATED AND AROMATIC HYDROCARBONS
FIELD ANALYSES RESULTS FOR SOIL GAS SAMPLES
SITE LOCATED AT 10643 SOUTH NORWALK BOULEVARD, SANTA FE SPRINGS, CALIFORNIA
25-TARGET COMPOUND LIST

PID/ELCD #2 - 5/2/98
FILE: 315ASGRP.WK3

SAMPLE ID			SG14-15	SG15-15	SG15-15	SG15-15	SG15-15	SG15-15	NA	NA	NA	
DATE			5/2/98	5/2/98	5/2/98	5/2/98	5/2/98	5/2/98	NA	NA	NA	
TIME			15:48	18:12	18:34	18:52	17:08	17:08	NA	NA	NA	
INJECTION VOLUME (ul)			25	500	50	10	5	5	NA	NA	NA	
PURGE VOLUME (ml)			170	170	170	170	170	170	NA	NA	NA	
VACUUM (in. Hg)			ND	ND	ND	ND	ND	ND	NA	NA	NA	
DILUTION FACTOR			1800.0	1.0	10.0	50.0	100.0	100.0	NA	NA	NA	
COMMENTS	RT		ARF		Dilution							
					1:80							
Dichlorodifluoromethane	2:50	8.77E+07	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND
Vinyl chloride	3:28	4.37E+08	0.00E+00 ND < 1600	4.24E+07 194 *	4.61E+08 211	4.76E+05 109	1.20E+05 ND < 100	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND
Chloroethane	3:55	3.10E+08	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND
Trichlorofluoromethane	3:75	8.79E+08	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND
1,1,2-Trichloro-trifluoroethane	4:38	1.37E+09	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND
1,1-Dichloroethane	4:38	2.49E+07	0.00E+00 ND < 1600	2.08E+05 17	1.91E+04 15	2.89E+03 ND < 50	0.00E+00 ND < 100	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND
Methylene chloride	4:53	1.07E+09	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND
trans-1,2-Dichloroethene	5:24	1.04E+09	0.00E+00 ND < 1600	2.82E+07 50 *	5.92E+08 114	2.58E+05 ND < 50	8.87E+04 ND < 100	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND
1,1-Dichloroethane	5:72	9.38E+08	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND
cis-1,2-Dichloroethene	6:38	1.13E+09	0.00E+00 ND < 1600	8.09E+07 108 *	1.95E+07 348 *	3.03E+06 269	7.40E+05 131	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND
Chloroform	6:75	1.31E+09	0.00E+00 ND < 1600	0.00E+00 ND < 1	0.00E+00 ND < 10	0.00E+00 ND < 50	0.00E+00 ND < 100	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND
1,1,1-Trichloroethane	7:01	1.18E+09	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND
Carbon tetrachloride	7:22	1.48E+09	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND
Benzene	7:48	9.07E+07	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND
1,2-Dichloroethane	7:47	1.32E+09	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND
Trichloroethene	8:28	1.19E+09	0.00E+00 ND < 1600	8.52E+07 110 *	2.10E+07 352 *	2.68E+08 225	7.81E+05 128	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND
Toluene	10:04	8.74E+07	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND
1,1,2-Trichloroethane	10:52	9.68E+08	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND
Tetrachloroethane	10:51	1.43E+09	1.84E+07 41300	2.04E+08 288 *	8.17E+07 1140 *	3.37E+07 2380 *	2.17E+07 3040	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND
1,1,1,2-Tetrachloroethane	12:38	1.12E+09	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND
Ethylbenzene	12:40	8.04E+07	0.00E+00 ND < 1800	1.96E+08 65 *	1.10E+05 38	8.34E+03 ND < 50	0.00E+00 ND < 100	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND
meta and para-Xylene	12:59	1.69E+08	0.00E+00 ND < 1800	3.15E+08 37 *	2.05E+05 24	1.26E+04 ND < 50	0.00E+00 ND < 100	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND
ortho-Xylene	13:26	6.32E+07	0.00E+00 ND < 1800	1.87E+08 53 *	8.67E+04 21	1.32E+04 ND < 50	0.00E+00 ND < 100	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND
1,1,2,2-Tetrachloroethane	14:34	8.86E+08	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND	0.00E+00 ND

ND = not detected; analyte is below the reportable limit of quantitation for this sample
RT = retention time
ul = microliter
in. Hg = inches of Mercury

Concentrations reported in micrograms per liter (ug/L)
ARF = average response factor
ml = milliliter
* = compound detected out of calibration range

5/2/98

TABLE B-2
QUALITY ASSURANCE/QUALITY CONTROL REPORT
DAILY MID-POINT, BLANK ANALYSIS, AND LAST GC TEST RUN
MAY 2, 1996

PID/ELCD: #2
FILE: 315AQCMP.WK

		DAILY MID-POINT			BLANK	LAST GC TEST RUN		
STANDARD CONC. (ug/L)		5000	AVERAGE		AMBIENT AIR	5000	AVERAGE	
INJECTION VOLUME(uL)		1.00	RESPONSE	PERCENT	500	1.00	RESPONSE	PERCENT
COMPOUND/WEIGHT(ug)	RT	0.00500	FACTOR	DIFFERENCE		0.00500	FACTOR	DIFFERENCE
Dichlorodifluoromethane	2:90	0			0.00E+00	0		
RF		0.00E+00	8.77E+07	NA	ND	0.00E+00	8.77E+07	NA
Vinyl chloride	3:26	2065017			0.00E+00	2105921		
RF		4.13E+08	4.37E+08	-5	ND	4.21E+08	4.37E+08	-4
Chloroethane	3:55	0			0.00E+00	0		
RF		0.00E+00	3.10E+08	NA	ND	0.00E+00	3.10E+08	NA
Trichlorofluoromethane	3:75	0			0.00E+00	0		
RF		0.00E+00	6.79E+08	NA	ND	0.00E+00	6.79E+08	NA
1,1,2-Trichloro-trifluoroethane	4:36	0			0.00E+00	0		
RF		0.00E+00	1.37E+09	NA	ND	0.00E+00	1.37E+09	NA
1,1-Dichloroethene (PID)	4:36	119316			0.00E+00	102245		
RF		2.39E+07	2.49E+07	-4	ND	2.04E+07	2.49E+07	-18
Methylene chloride	4:93	0			0.00E+00	0		
RF		0.00E+00	1.07E+09	NA	ND	0.00E+00	1.07E+09	NA
trans-1,2-Dichloroethene	5:24	5246480			0.00E+00	4964815		
RF		1.05E+09	1.04E+09	1	ND	9.93E+08	1.04E+09	-5
1,1-Dichloroethane	5:72	4987071			0.00E+00	4961129		
RF		9.97E+08	9.38E+08	6	ND	9.92E+08	9.38E+08	6
Cis-1,2-Dichloroethane	6:39	4954397			0.00E+00	4654370		
RF		9.91E+08	1.13E+09	-12	ND	9.31E+08	1.13E+09	-18
Chloroform	6:75	6636963			0.00E+00	5894290		
RF		1.33E+09	1.31E+09	1	ND	1.18E+09	1.31E+09	-10
1,1,1-Trichloroethane	7:01	6017679			0.00E+00	5347336		
RF		1.20E+09	1.18E+09	2	ND	1.07E+09	1.18E+09	-9
Carbon tetrachloride	7:22	0			0.00E+00	0		
RF		0.00E+00	1.48E+09	NA	ND	0.00E+00	1.48E+09	NA
Benzene (PID)	7:46	463800			0.00E+00	440931		
RF		9.28E+07	9.07E+07	2	ND	8.82E+07	9.07E+07	-3
1,2-Dichloroethane	7:47	6720263			0.00E+00	6730511		
RF		1.34E+09	1.32E+09	2	ND	1.35E+09	1.32E+09	2
Trichloroethene	8:28	5853631			0.00E+00	5256518		
RF		1.17E+09	1.19E+09	-2	ND	1.05E+09	1.19E+09	-12
Toluene (PID)	10:04	432428			0.00E+00	436567		
RF		8.65E+07	8.74E+07	-1	ND	8.73E+07	8.74E+07	-0
1,1,2-Trichloroethane	10:62	5374968			0.00E+00	5001922		
RF		1.07E+09	9.68E+08	11	ND	1.00E+09	9.68E+08	3
Tetrachloroethene	10:91	6993416			0.00E+00	5891035		
RF		1.40E+09	1.43E+09	-2	ND	1.18E+09	1.43E+09	-18
1,1,1,2-Tetrachloroethane	12:36	0			0.00E+00	0		
RF		0.00E+00	1.12E+09	NA	ND	0.00E+00	1.12E+09	NA
Ethylbenzene (PID)	12:40	301351			0.00E+00	294834		
RF		6.03E+07	6.04E+07	-0	ND	5.90E+07	6.04E+07	-2
m,p-Xylene (PID)	12:59	865077			0.00E+00	875500		
RF		1.73E+08	1.69E+08	2	ND	1.75E+08	1.69E+08	4
o-Xylene (PID)	13:26	318509			0.00E+00	314029		
RF		6.37E+07	6.32E+07	1	ND	6.28E+07	6.32E+07	-1
1,1,2,2-Tetrachloroethane	14:34	0			0.00E+00	0		
RF		0.00E+00	8.86E+08	NA	ND	0.00E+00	8.86E+08	NA

RT = Retention Time
RF = Response Factor
NA = Not Applicable

ug/L = microgram per Liter
uL = microliter
ug = microgram

5/2/96

ANALYST: Ragi Abraham

REVIEWED BY: David M. Pride

TABLE B-3
RESPONSE FACTORS FOR THREE POINT CALIBRATION
SUBJECT SITE, CALIFORNIA
APRIL 24, 1996

PDELCD #2
FILE 424063PT.WIS

STANDARD CONC. (ug/L) INJECTION VOLUME(uL) COMPOUND/WEIGHT(ug)	RT	5000 0.50 0.0025	5000 1.00 0.0050	5000 2.00 0.0100	AVERAGE RESPONSE FACTOR	STANDARD DEVIATION	RELATIVE % STANDARD DEVIATION
Dichlorodifluoromethane CF	2.90	194482 7.78E+07	420918 8.42E+07	1012432 1.01E+08	8.77E+07	1.21E+07	14
Vinyl chloride CF	3.26	958056 3.83E+08	2347988 4.70E+08	4591034 4.59E+08	4.37E+08	4.71E+07	11
Chloroethane CF	3.55	803430 3.21E+08	1519289 3.04E+08	3037713 3.04E+08	3.10E+08	1.01E+07	3
Trichlorofluoromethane CF	3.75	1670633 6.68E+08	3327440 6.65E+08	7030350 7.03E+08	6.79E+08	2.09E+07	3
1,1,2-Trichloro-trifluoroethane CF	4.36	3068454 1.23E+09	7195634 1.44E+09	14318027 1.43E+09	1.37E+09	1.20E+08	9
1,1-Dichloroethene (PID) CF	4.36	55032 2.20E+07	110627 2.21E+07	305725 3.06E+07	2.49E+07	4.91E+06	20
Methylene chloride CF	4.93	2517211 1.01E+09	5506436 1.10E+09	11128812 1.11E+09	1.07E+09	5.81E+07	5
trans-1,2-Dichloroethene CF	5.24	2272591 9.09E+08	5332875 1.07E+09	11409777 1.14E+09	1.04E+09	1.18E+08	11
1,1-Dichloroethane CF	5.72	2108242 8.43E+08	4917295 9.83E+08	9875290 9.88E+08	9.38E+08	8.21E+07	9
cis-1,2-Dichloroethene CF	6.39	2630404 1.05E+09	5837384 1.17E+09	11568102 1.16E+09	1.13E+09	6.37E+07	6
Chloroform CF	6.75	3071756 1.23E+09	6811353 1.36E+09	13319420 1.33E+09	1.31E+09	7.00E+07	5
1,1,1-Trichloroethane CF	7.01	2879068 1.15E+09	6038728 1.21E+09	11710360 1.17E+09	1.18E+09	2.85E+07	2
Carbon tetrachloride CF	7.22	3429459 1.37E+09	7707342 1.54E+09	15377948 1.54E+09	1.48E+09	9.69E+07	7
Benzene (PID) CF	7.46	202287 8.09E+07	463128 9.26E+07	987006 9.87E+07	9.07E+07	9.04E+06	10
1,2-Dichloroethane CF	7.47	3018098 1.21E+09	6997910 1.40E+09	13646475 1.36E+09	1.32E+09	1.02E+08	8
Trichloroethene CF	8.28	2720582 1.09E+09	6295165 1.26E+09	12216627 1.22E+09	1.19E+09	8.98E+07	8
Toluene (PID) CF	10.04	189615 7.58E+07	473986 9.48E+07	915154 9.15E+07	8.74E+07	1.01E+07	12
1,1,2-Trichloroethane CF	10.62	2201954 8.81E+08	5032679 1.01E+09	10166793 1.02E+09	9.68E+08	7.57E+07	8
Tetrachloroethene CF	10.91	3472760 1.39E+09	7181440 1.44E+09	14630275 1.46E+09	1.43E+09	3.74E+07	3
1,1,1,2-Tetrachloroethane CF	12.36	2520257 1.01E+09	5831261 1.17E+09	11888172 1.19E+09	1.12E+09	9.85E+07	9
Ethylbenzene (PID) CF	12.40	128137 5.13E+07	303366 6.07E+07	692977 6.93E+07	6.04E+07	9.02E+06	15
m,p-Xylene (PID) CF	12.59	375763 1.50E+08	841106 1.68E+08	1871726 1.87E+08	1.69E+08	1.84E+07	11
o-Xylene (PID) CF	13.26	149216 5.97E+07	304855 6.10E+07	688187 6.88E+07	6.32E+07	4.94E+06	8
1,1,2,2-Tetrachloroethane CF	14.34	1929867 7.72E+08	4749621 9.50E+08	9372528 9.37E+08	8.86E+08	9.93E+07	11

RT = Retention Time
CF = Calibration Factor

ug/L = Micrograms per Liter
uL = Microliter
ug = Microgram

4/24/96

Analyst: David M. Pride

Reviewed by: Ragi Abraham

TABLE B-4
QUALITY ASSURANCE/QUALITY CONTROL REPORT
LAB CONTROL SAMPLE, BLANK ANALYSIS, AND LAST GC TEST RUN
APRIL 24, 1996

PID/ELCD #2
FILE: 424QCLC.WK

		LAB CONTROL SAMPLE			BLANK	LAST GC TEST RUN		
STANDARD CONC. (ug/L)		5000	AVERAGE		AMBIENT AIR	5000	AVERAGE	
INJECTION VOLUME(uL)		1.00	RESPONSE		500	1.00	RESPONSE	
COMPOUND/WEIGHT(ug)	RT	0.00500	FACTOR	PERCENT DIFFERENCE		0.00500	FACTOR	PERCENT DIFFERENCE
Dichlorodifluoromethane	2:90	502880			0.00E+00	0		
RF		1.01E+08	8.77E+07	15	ND	0.00E+00	8.77E+07	NA
Vinyl chloride	3:26	2681826			0.00E+00	0		
RF		5.36E+08	4.37E+08	23	ND	0.00E+00	4.37E+08	NA
Chloroethane	3:55	1507950			0.00E+00	0		
RF		3.02E+08	3.10E+08	-3	ND	0.00E+00	3.10E+08	NA
Trichlorofluoromethane	3:75	3673783			0.00E+00	0		
RF		7.35E+08	6.79E+08	8	ND	0.00E+00	6.79E+08	NA
1,1,2-Trichloro-trifluoroethane	4:36	7582873			0.00E+00	0		
RF		1.52E+09	1.37E+09	11	ND	0.00E+00	1.37E+09	NA
1,1-Dichloroethene (PID)	4:36	105830			0.00E+00	0		
RF		2.12E+07	2.49E+07	-15	ND	0.00E+00	2.49E+07	NA
Methylene chloride	4:93	5762127			0.00E+00	0		
RF		1.15E+09	1.07E+09	8	ND	0.00E+00	1.07E+09	NA
trans-1,2-Dichloroethene	5:24	5517709			0.00E+00	0		
RF		1.10E+09	1.04E+09	6	ND	0.00E+00	1.04E+09	NA
1,1-Dichloroethane	5:72	5125724			0.00E+00	0		
RF		1.03E+09	9.38E+08	9	ND	0.00E+00	9.38E+08	NA
Cis-1,2-Dichloroethene	6:39	6113127			0.00E+00	0		
RF		1.22E+09	1.13E+09	8	ND	0.00E+00	1.13E+09	NA
Chloroform	6:75	7133083			0.00E+00	0		
RF		1.43E+09	1.31E+09	9	ND	0.00E+00	1.31E+09	NA
1,1,1-Trichloroethane	7:01	6414289			0.00E+00	0		
RF		1.28E+09	1.18E+09	9	ND	0.00E+00	1.18E+09	NA
Carbon tetrachloride	7:22	8044397			0.00E+00	0		
RF		1.61E+09	1.48E+09	9	ND	0.00E+00	1.48E+09	NA
Benzene (PID)	7:46	439057			0.00E+00	0		
RF		8.78E+07	9.07E+07	-3	ND	0.00E+00	9.07E+07	NA
1,2-Dichloroethane	7:47	7005227			0.00E+00	0		
RF		1.40E+09	1.32E+09	6	ND	0.00E+00	1.32E+09	NA
Trichloroethene	8:28	6508275			0.00E+00	0		
RF		1.30E+09	1.19E+09	9	ND	0.00E+00	1.19E+09	NA
Toluene (PID)	10:04	404203			0.00E+00	0		
RF		8.08E+07	8.74E+07	-8	ND	0.00E+00	8.74E+07	NA
1,1,2-Trichloroethane	10:62	5143977			0.00E+00	0		
RF		1.03E+09	9.68E+08	6	ND	0.00E+00	9.68E+08	NA
Tetrachloroethene	10:91	7195941			0.00E+00	0		
RF		1.44E+09	1.43E+09	1	ND	0.00E+00	1.43E+09	NA
1,1,1,2-Tetrachloroethane	12:36	5779558			0.00E+00	0		
RF		1.16E+09	1.12E+09	3	ND	0.00E+00	1.12E+09	NA
Ethylbenzene (PID)	12:40	290953			0.00E+00	0		
RF		5.82E+07	6.04E+07	-4	ND	0.00E+00	6.04E+07	NA
m,p-Xylene (PID)	12:59	814875			0.00E+00	0		
RF		1.63E+08	1.69E+08	-4	ND	0.00E+00	1.69E+08	NA
o-Xylene (PID)	13:26	298940			0.00E+00	0		
RF		5.98E+07	6.32E+07	-5	ND	0.00E+00	6.32E+07	NA
1,1,2,2-Tetrachloroethane	14:34	4975911			0.00E+00	0		
RF		9.95E+08	8.86E+08	12	ND	0.00E+00	8.86E+08	NA

RT = Retention Time
RF = Response Factor
NA = Not Applicable

ug/L = microgram per Liter
uL = microliter
ug = microgram

04/24/96

ANALYST: David M. Pride

REVIEWED BY: Ragi Abraham

Table B-5
Environmental Support Technologies, Inc.
Detection Limits for Soil Gas Surveys

Detection Limits or Reportable Limits of Quantitation for Halogenated and Aromatic Hydrocarbons are 1 ug/L when the injection volume is 500 uL. For lesser injection volumes detection limits are listed below.

Injection Volume (uL)	Detection Limit (ug/L)
500	1.0
250	2.0
200	2.5
100	5.0
80	6.3
60	8.3
50	10.0
40	12.5
20	25.0
10	50.0
5	100.0
1	500.0



**WORK PLAN
TO PERFORM A
MULTI-DEPTH SOIL GAS SURVEY**

**CONTINENTAL HEAT TREATING
10643 SOUTH NORWALK BOULEVARD
SANTA FE SPRINGS, CALIFORNIA**

Prepared for:

**James G. Stull
10643 South Norwalk Boulevard
Santa Fe Springs, California 90670**

Prepared by:

**Environmental Support Technologies, Inc.
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(714) 457-9664
Fax (714) 457-0664**

(Project EST1315)

November 20, 1995

1.0 INTRODUCTION

This Work Plan to Perform a Multi-Depth Soil Gas Survey at Continental Heat Treating (CHT) located at 10643 South Norwalk Boulevard in Santa Fe Springs, California, was prepared by Environmental Support Technologies, Inc. (EST) in response to a request from Mr. James Stull of CHT.

2.0 PREVIOUS SITE ASSESSMENT WORK

Previous site assessment work at CHT includes drilling and soil sampling conducted on February 6, 1995 by Green Environmental, Inc. A single soil boring was advanced in the vicinity of a former above-ground vapor degreaser unit. Soil samples for laboratory analyses using EPA Method 8240 were collected from approximately 0.5-foot, 5-feet, and 10-feet below grade. Concentrations of tetrachloroethene (PCE) and trichloroethene (TCE) were detected in the soil sample collected from approximately 0.5-foot below grade, at concentrations of 7,514 micrograms per kilogram ($\mu\text{g/Kg}$), and 4,759 $\mu\text{g/Kg}$, respectively.

3.0 PROPOSED SCOPE OF WORK

The scope of soil gas survey work proposed within was based on requirements outlined by the Site Mitigation Unit Health Hazardous Materials Division of the County of Los Angeles Fire Department. The proposed multi-depth survey includes the installation of thirteen (13) 5-foot soil gas probes and two (2) 15-foot soil gas probes. Soil gas samples will subsequently be collected from the probes and analyzed for volatile organic compounds (VOCs) on-site using a mobile field laboratory.

4.0 OBJECTIVES OF PROPOSED SOIL GAS SURVEY

The objectives of the proposed multi-depth soil gas survey are to:

- Aid in identifying vadose zone source areas of VOCs;
- Assess the lateral and limited vertical extent of potential shallow soil contamination by VOCs.

Soil gas surveying has limited applications and results are dependent on site-specific conditions. Some factors affecting the distribution of VOCs in the subsurface are listed in Appendix A.

5.0 RATIONALE FOR SOIL GAS PROBE LOCATIONS

The approximate locations of the proposed shallow (5-foot-deep) soil gas probes are shown in Figure 1. The proposed soil gas sampling probe locations were selected based on results of the above-referenced soil sampling work, and to aid in the further assessment of the lateral and limited vertical extent of soils potentially impacted by VOCs in the vicinity of the former vapor degreaser. Two additional deeper (15-foot-deep) soil gas probes will be installed and sampled after reviewing analyses results for soil gas samples collected from shallow probes.

6.0 FIELD METHODS AND PROCEDURES

This section describes the methods and procedures to be used to conduct the proposed soil gas survey. EST will perform the soil gas survey in accordance with the Los Angeles Regional Water Quality Control Board (LARWQCB) "Requirements for Active Soil Gas Investigation" dated March 1994. A recent telephone conversation with Mr. George Baker (LACFD) indicated that the March 1994 LARWQCB protocols are acceptable to the LACFD. Some procedures may be modified based on evaluation of project needs. Modifications to these procedures, if necessary, will be approved prior to implementation and will be described in the soil gas survey report.

6.1 SOIL GAS PROBE INSTALLATION AND COMPLETION

A typical soil gas sampling probe is shown in Figure 2. Soil gas probes will be initially installed to approximately five feet below grade. Probes will be installed using either a percussion hammer or hydraulic ram with percussion hammer. Once a probe has been installed to the desired depth, the probe shaft will be withdrawn, leaving the probe point and sampling tube in the subsurface. A small amount of silica sand will be poured into the probe hole to allow soil gas to migrate to the sampling point. The remaining annulus will be backfilled with cement/bentonite grout to grade. Upon completion of soil gas sampling, the sampling tube will be plugged with a stainless-steel machine screw and pushed below grade. The remaining depression will be completed at grade using concrete patch material. The probe point and sampling tube assembly will be left as a long-term soil gas monitoring point, unless otherwise specified prior to entering the field, to allow subsequent soil gas sampling and analysis, if desired.

6.2 SAMPLE COLLECTION AND HANDLING

Soil gas samples will be collected using the soil gas sampling system shown in Figure 3. Initially, site-specific probe purging and sample volume calibrations will be performed to evaluate the appropriate volume of gas to be purged from each probe prior to sample collection. This will be done by performing time-series sampling of at least one (1) probe to evaluate trends in soil gas concentrations as a function of purge volume. Soil gas samples will be analyzed in the field immediately following collection. Soil gas samples will be analyzed by direct gas injection into a laboratory-grade, field-operable gas chromatograph (GC).

6.3 SOIL GAS SAMPLE ANALYSIS

Soil gas samples will be analyzed in the field using a field-operable GC equipped with a photo-ionization detector (PID) and an electrolytic conductivity detector (ELCD). The PID and ELCD (if used) will be used in-series to analyze for target compounds as specified in the LARWQCB requirements (March 1994) including halogenated and aromatic hydrocarbons. Detection limits for the LARWQCB target compounds will be no more than one microgram per liter ($\mu\text{g/L}$) of gas except when a compound concentration exceeds the initial calibration range. When sample dilution (or smaller injection volume) is required to maintain analytes within the calibration range, this results in raised detection limits for the analysis. A series of quality assurance/quality control (QA/QC) analyses will be performed prior to, during, and following the analysis of soil gas samples. A summary of QA/QC analyses is presented in Table 1, and each analysis is described below.

6.4 INITIAL MULTI-POINT EQUIPMENT CALIBRATION

The chromatographic equipment used for soil gas analyses will be calibrated using high-purity solvent-based standards obtained from certified vendors or using gas standards prepared in the field (for TVHs). Standards are typically prepared in high-purity methanol or dodecane solvent. Calibration using solvent-based standards will be performed using varying injection volumes of the stock solvent-based standard without dilution. Stock solvent-based standards will be diluted to an appropriate concentration, if necessary. Diluted standards will be prepared by introducing a known volume of solvent-based standard into a known volume of high-purity solvent.

Initial calibration will be performed for EPA Method 8010/8020 compounds. The GC will be calibrated using three standard injections to establish a three-point calibration curve. The lowest standard will not be higher than five times the Method Detection Limit (or $5 \mu\text{g/L}$). The percent relative standard deviation (%RSD) of the response factor (RF) for each target compound will not exceed 20 percent except for trichlorofluoromethane (Freon 11), dichlorodifluoromethane (Freon 12), trichlorotrifluoromethane (Freon 113), chloroethane, and vinyl chloride which will not exceed 30 %RSD. Identification and quantitation of compounds in the field will be based on calibration under the same analytical conditions as for three-point calibration.

6.5 LABORATORY CONTROL SAMPLE (LCS)

A laboratory control sample (LCS) from a second source independent from the initial calibration standard will be used to verify the true concentration of the initial calibration standard. The LCS will include the LARWQCB target compounds and the RF for each compound will be within 15 percent of the initial calibration.

6.6 DAILY MID-POINT CALIBRATION CHECK

Daily calibration of the gas chromatograph will consist of a mid-point calibration analyses using the same standard as used for the initial multi-point calibration. The daily mid-point calibration check will include the 12 target compounds as specified in the LARWQCB requirement (March 1994). The RF of each compound (except for Freons 11, 12, and 113, chloroethane, and vinyl chloride) will be within 15 percent difference of the average RF from the initial calibration. The RF for the Freons 11, 12, and 113, chloroethane, and vinyl chloride will be within 25 percent difference of the initial calibration. If these criteria are not met, the GC will be re-calibrated. Daily calibration will be performed prior to the first sample analysis of the day. One-point calibration will be performed for all compounds detected at a particular site to ensure accurate quantitation. Subsequent calibration episodes, if deemed necessary, will consist of at least one injection of the standard exhibiting a similar detector response as that of samples encountered in the field.

6.7 BLANK INJECTIONS

Prior to sampling each day, a syringe used for soil gas sample collection will be filled with ambient air or ultra-high-purity carrier-grade gas from a compressed gas cylinder. The ambient air or high-purity gas will be injected directly into the GC. The blank injection will serve to detect potential cross-contamination of the sampling syringe, and to verify the effectiveness of equipment decontamination procedures.

6.8 END OF DAY GC TEST RUN

A LCS will be analyzed at the end of each day. The LCS will contain the same compounds as the daily mid-point calibration standard (minimum 12 compounds). The LCS must be from a second source independent from the initial multi-point calibration standard. The RF for each compound will be within 20 percent difference of the average RF for the initial calibration. If this criteria is not met, additional LCS will be analyzed to satisfy this criteria.

6.9 DECONTAMINATION PROCEDURES

Probes and equipment in contact with the soil gas sample stream will be decontaminated prior to initiation of sampling. Decontamination of soil gas sampling equipment will be conducted by repeated washing and/or by baking in the gas chromatograph oven. Washing will include the use of a phosphate-free detergent wash, tap water rinse, organic-free water rinse, and followed by air drying.

6.10 SHORTENING THE GC RUN TIME

Shortening the GC run time is acceptable only if the chemist feels that doing so will not sacrifice the quality of data obtained and doing so meets the approval of appropriate client and agency personnel.

6.11 REPORTING OF RESULTS AND QA/QC INFORMATION

Reporting of sample results and QA/QC information will be performed in accordance with the Los Angeles Regional Water Quality Control Board's "QA/QC and Reporting Requirement for Soil Gas Investigation" dated March 1994.

7.0 REPORT PREPARATION

A report will be prepared describing the results of the soil gas survey. The report will include:

- Soil gas concentration data in tabular form.
- Quality Assurance/Quality Control Data.
- Descriptions of any modifications made to the standard sampling and analyses methods typically used by EST.

A draft copy of the soil gas survey report will be submitted to CHT or assigned interested parties. Upon approval, EST will submit three copies of the soil gas survey report to the LACFD.

1. *Chlorophyll *a** and *Chlorophyll *b** were determined by the method of Arar and Cook (1987).

1

1. **Introduction**

1.

only common to good

Key words: *Chlamydia trachomatis*; *Neisseria meningitidis*; *Neisseria gonorrhoeae*; *Streptococcus pneumoniae*; *Haemophilus influenzae*

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TABLES

TABLE 1
SUMMARY OF
QUALITY ASSURANCE/QUALITY CONTROL ANALYSES
FOR SOIL GAS SURVEYS

CALIBRATION AND LABORATORY CONTROL SAMPLES

DESCRIPTION	FREQUENCY	PRECISION GOAL %RSD or %DIFF
INITIAL THREE-POINT CALIBRATION (25 Target Compounds)	At the beginning of the soil gas survey, unless the RPDs of the initial laboratory check sample or daily mid-point calibration check samples exceed their goals.	20-30 (1)
INITIAL LABORATORY CONTROL SAMPLE (LCS) (25 Target Compounds)	At the beginning of the survey, following the initial three-point calibration.	15 (2)
DAILY MID-POINT CALIBRATION CHECK (12 Target Compounds)	At the beginning of each day.	15 (3) 25 (3)
LAST GC TEST RUN (12 Target Compounds)	At the end of each day.	20 (4)

FIELD CONTROL SAMPLES

DESCRIPTION	FREQUENCY	PRECISION GOAL
BACKGROUND SAMPLE (5)	Minimum one per day.	N/A
SYRINGE BLANK (5)	Minimum one per day.	N/A

%RSD = Percent Relative Standard Deviation calculated based on the initial three-point calibration.

%DIFF = Percent Difference between the response factor obtained from the LCS, the daily mid-point calibration, or the last GC test run and the average response factor initially calculated based on the three-point calibration.

N/A = Not applicable.

(1) The %RSD goal for the initial three-point calibration will be 20 percent for all compounds except for Freon 11, Freon 12, Freon 113, chloroethane, and vinyl chloride for which the %RSD goal is 30 percent.

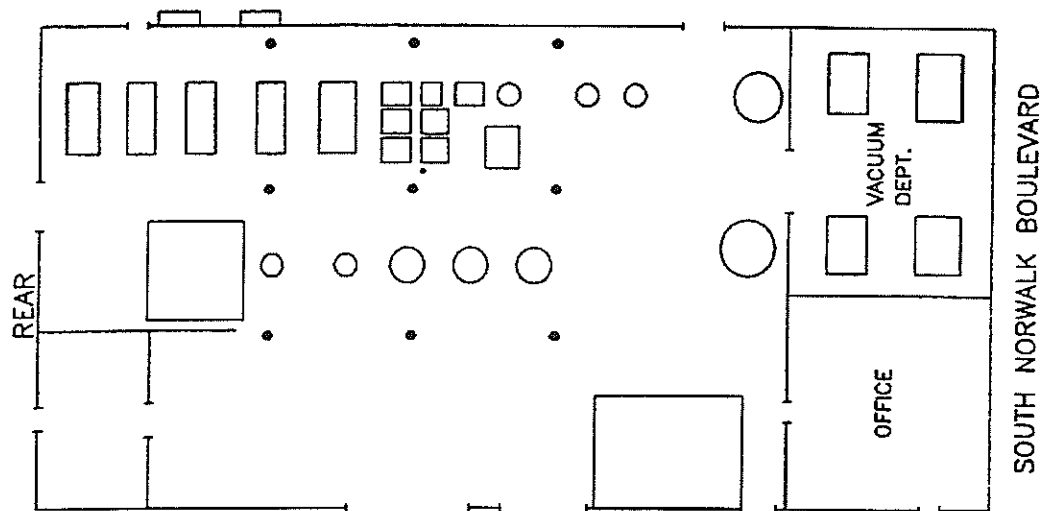
(2) The %DIFF goal for the LCS will be 15 percent for all target compounds.

(3) The %DIFF goal for the daily mid-point calibration check will be 15 percent for all compounds except for Freon 11, Freon 12, Freon 113, chloroethane, and vinyl chloride for which the %DIFF goal is 25 percent.

(4) The %DIFF goal for the last GC test run will be 20 percent for all compounds except for Freon 11, Freon 12, Freon 113, chloroethane, and vinyl chloride for which the %DIFF goal is 30 percent.

(5) A syringe/background sample will be analyzed using ambient air. If volatile organic compounds (VOCs) are not detected, the ambient air sample will represent the background sample and syringe blank. If VOCs are detected in the ambient air sample, a syringe blank will be analyzed using ultra-high-purity helium or nitrogen gas.

FIGURES



EXPLANATION

0 20 40
APPROXIMATE SCALE IN FEET

- APPROXIMATE LOCATION OF A 5-FOOT SOIL GAS SAMPLING PROBE
- FURNACES
- FURNACES

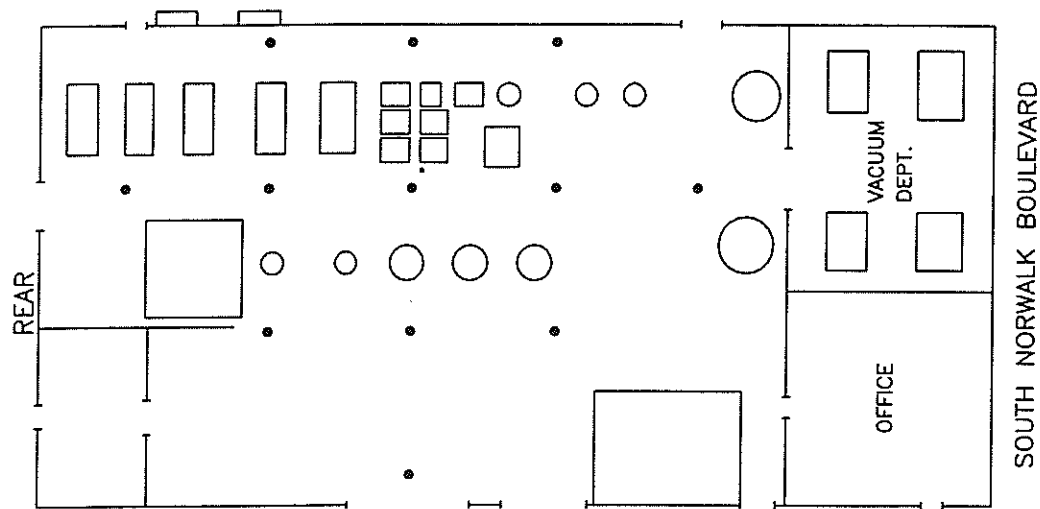
FIGURE 1

APPROXIMATE LOCATIONS OF
SOIL GAS SAMPLING PROBES
CONTINENTAL HEAT TREATING, INC.
10643 SOUTH NORWALK BOULEVARD
SANTA FE SPRINGS, CALIFORNIA
EST1315 / SOIL GAS SURVEY WORK PLAN

DRAWN BY: JST

SCALE: AS SHOWN

DATE: 11-17-1995



EXPLANATION

- APPROXIMATE LOCATION OF A 5-FOOT SOIL GAS SAMPLING PROBE
- FURNACES
- FURNACES

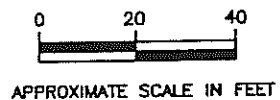


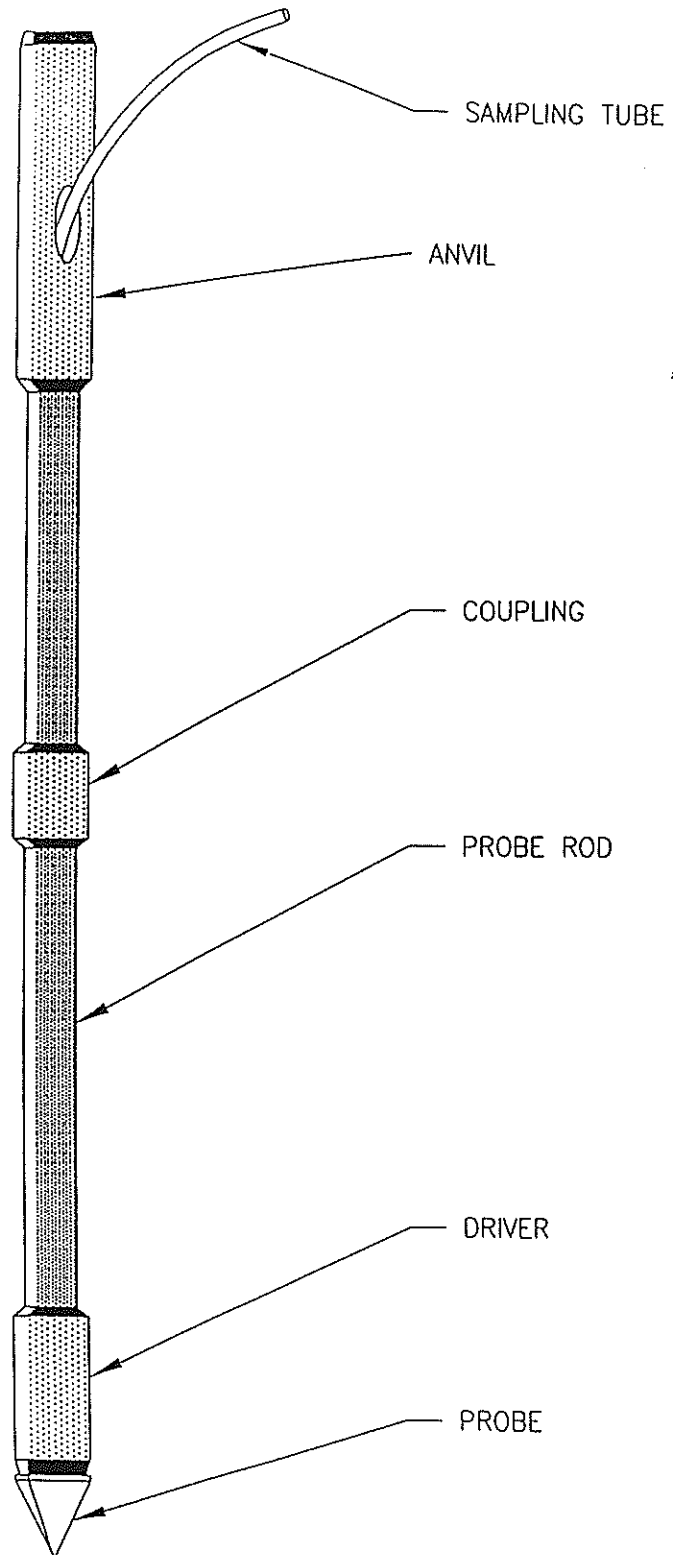
FIGURE 1

APPROXIMATE LOCATIONS OF
SOIL GAS SAMPLING PROBES
CONTINENTAL HEAT TREATING, INC.
10643 SOUTH NORWALK BOULEVARD
SANTA FE SPRINGS, CALIFORNIA
EST1315 / SOIL GAS SURVEY WORK PLAN

DRAWN BY: JST

SCALE: AS SHOWN

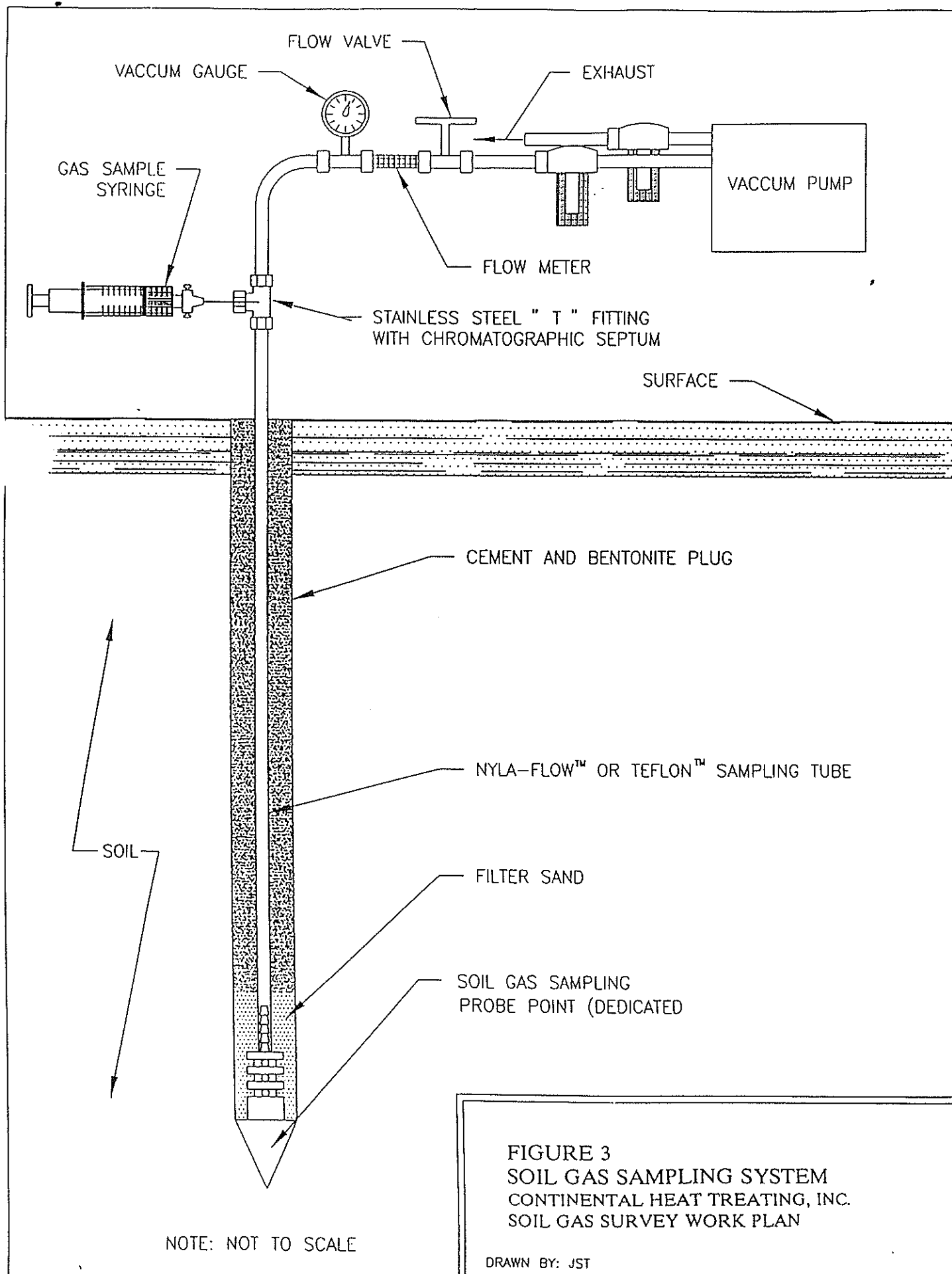
DATE: 11-17-1995



NOTE: NOT TO SCALE

FIGURE 2
TYPICAL SOIL GAS SAMPLING PROBE
(During Installation Process)
CONTINENTAL HEAT TREATING, INC.
SOIL GAS SURVEY WORK PLAN

DRAWN BY: JST



APPENDICES

Appendix A

FACTORS AFFECTING THE GAS-PHASE DISTRIBUTION OF VOCs IN THE SUBSURFACE

Soil and groundwater contamination by volatile organic compounds (VOCs) can often be detected by analyzing trace gases in soils just below ground surface. This technique is possible because many VOCs will volatilize and move, by molecular diffusion, away from source areas toward regions of lower concentration. A gas phase concentration gradient from the source to adjacent areas is established.

The following factors affect the transport and gas phase distribution of VOCs in the subsurface.

1. The liquid-gas partitioning coefficient of the compounds of interest (the "volatility" of the compound).
2. The vapor diffusivity, which is a measure of how quickly an individual compound "spreads out" within a volume of gas.
3. Retardation of the individual compounds as they migrate in the soil gas. Retardation may be due to degradation, adsorption on the soil matrix, tortuosity of the soil profile, or entrapment in unconnected pores.
4. The presence of impeding layers, wetting fronts of freshwater, or perched water tables between the regional water table and ground surface.
5. The presence of soil moisture around man-made structures, such as clarifiers and sumps, may suppress volatilization and diffusion of VOCs resulting in false negative or low soil gas concentrations.
6. The presence of contaminants from localized spills or in the ambient air.
7. Movement of soil gas in response to barometric pressure changes.
8. The preferential migration of gas through zones of greater permeability (e.g. natural lithologic variation or back-fill of underground utilities).

At most sites, many of these factors are unknown or poorly understood. Due to this uncertainty, soil gas survey should be considered in conjunction with other data.

GEI File
Copy



GREEN ENVIRONMENTAL, INC.

6727 Greenleaf Avenue, Whittier, CA 90601 • (310) 698-5338 Fax: (310) 698-6358

March 20, 1995

Mr. James Stull
Continental Heat Treating
10643 S. Norwalk Boulevard
Santa Fe Springs, California

RE: LIMITED SUBSURFACE SITE INVESTIGATION
Continental Heat Treating
10643 S. Norwalk Boulevard
Santa Fe Springs, California

Dear Mr. Stull:

In accordance with your request and authorization, Green Environmental, Inc. (GEI) has prepared the attached Site Investigation Report, for the above referenced property. This investigation was conducted by GEI and consisted solely of the activities described herein. The findings, conclusions and recommendations are subject to the limitations contained within Section 6.0, Limitations.

Should you have any questions regarding this report, please do not hesitate to contact the undersigned at your convenience. GEI appreciates the opportunity to be of service to you.

Respectfully Submitted,
Green Environmental, Inc.

Kent Green
President

Peter W. Martin
Registered Geologist #4561





GREEN ENVIRONMENTAL, INC.

6727 Greenleaf Avenue, Whittier, CA 90601 • (310) 698-5338 Fax: (310) 698-6358

SITE INVESTIGATION REPORT

CONTINENTAL HEAT TREATING
10643 S. NORWALK BOULEVARD
SANTA FE SPRINGS, CALIFORNIA

GEI Project No. 1038-568

PREPARED FOR:

Mr. James Stull
Continental Heat Treating
10643 S. Norwalk Boulevard
Santa Fe Springs, California 90670

PREPARED BY:

Green Environmental, Inc.
6727 Greenleaf Avenue
Whittier, California 90601

March 20, 1995



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2.0 PURPOSE & SCOPE OF WORK	1
3.0 FIELD INVESTIGATION	1
4.0 LABORATORY ANALYSES AND RESULTS	2
5.0 CONCLUSIONS	2
6.0 LIMITATIONS	3

ACCOMPANYING TABLES, FIGURES, AND APPENDICES

TABLES

#1 - Laboratory Results of Soil Sample Analyses

FIGURES

#1 - Site Plan/Boring Location

#2 - Log of Boring B-1

APPENDICES

A - Laboratory reports on soil samples, by ChemTek Inc. Environmental Laboratories, dated February 8, 1995. Laboratory QA/QC and chain-of-custody.

1.0 INTRODUCTION

This report presents Green Environmental, Inc.'s (GEI) findings and conclusions regarding a limited subsurface soil investigation conducted at the Continental Heat Treating Facility, located at 10643 S. Norwalk Boulevard, Santa Fe Springs, California. GEI conducted the investigation activities in accordance with your October 26, 1994 Workplan and as described in our approved Proposal, dated November 1, 1994.

2.0 PURPOSE & SCOPE OF WORK

As GEI understands, this limited subsurface investigation was conducted in response to a request by Mr. George Baker, Hazardous Materials Specialist of the Los Angeles County Fire Department Health Hazardous Materials Division (LACFD), concerning the potential presence of tetrachloroethene (PCE) in the soil beneath the subject site. The subsurface investigation was requested at an interior building at a location designated by Mr. Baker. The scope of work consisted of the following activities:

- * Advance one hand auger soil boring to a depth of 10 feet at the location shown on the Site Plan, Figure 1.
- * Collect three discreet soil samples, one at the soil surface and at the 5 and 10-foot depths.
- * Submit soil samples to a State certified laboratory for analysis using EPA Method 8240 for volatile organic compounds.
- * Prepare a report documenting the procedures followed and the results of laboratory analyses.

3.0 FIELD INVESTIGATION

Prior to conducting the field investigation, Mr. Baker, LACFD, was contacted to coordinate an agreeable time so that he would be available to observe the sampling activities. On February 6, 1995 GEI was on-site to conduct the investigation. Along with Mr. Baker, Mr. Stull, President, Continental Heat Treating, was also present to observe the activities and indicate the location of the boring. To access the soil beneath the concrete floor, a four-inch diameter concrete core was cut. Due to encountering thicker than expected concrete at the first designated location, the boring was moved approximately 1 foot to the east, at the location shown on Figure 1. Clean tap water, used very sparingly, was used to cool the core bit.

Following removal of the concrete core, a soil sample was collected at the soil surface, Sample B-1@6". The boring was drilled using a 2.5-inch diameter hand auger. Additional soil samples were collected at the 5 and 10-foot depths, Samples B-1@5' and B-1@10", respectively. Each sample was collected using a hand driven sampler, lined with one, 1.5 by 6-inch clean brass

tube. Upon retrieval, each sample tube was immediately sealed so as to prevent headspace in the sample tube. Each tube was capped with teflon sheets and plastic caps, wrapped with a non-VOC tape, labeled, sealed in a plastic bag, and placed in a cooler with ice for delivery to the laboratory for analysis. A log of the boring was prepared and is provided on Figure 2, Log of Boring B-1.

The hand auger was washed prior to beginning the boring and the soil sampling equipment was washed with a non-phosphate detergent, rinsed with tap and distilled water, and allowed to air dry between each sampling round. The boring was backfilled with the soil cuttings and capped with concrete, following sample collection.

4.0 LABORATORY ANALYSES AND RESULTS

The three soil samples were delivered under chain-of-custody protocol immediately following the field work, to CHEMTEK, Inc., located in Santa Fe Springs, California. Each sample was analyzed for volatile organic compounds using EPA Method 8240. Based on the results of laboratory analyses, PCE and trichloroethene (TCE) were detected in each sample, as shown in Table 1. The highest concentration of PCE was detected in the soil surface sample (B-1@6") with a reported concentration of 7,514 micrograms per kilogram (ug/kg or ppb). The soil sample from 10-feet (B-1@10') was reported to contain PCE at a concentration of 1,855 ug/kg.

Table 1.
Results of Analyses Using EPA Method 8240
(reported in micrograms per kilogram (ug/kg or ppb))

Sample Number	Tetrachloroethene (PCE)	Trichloroethene (TCE)
B-1 @ 6"	7,514	4,759
B-1 @ 5'	290	21
B-1 @ 10'	66	1,855

Several other organic compounds were detected at much lower concentrations, as indicated on the laboratory reports provided in Appendix A. The laboratory QA/QC data and a copy of the chain-of-custody are also included in Appendix A.

5.0 CONCLUSIONS

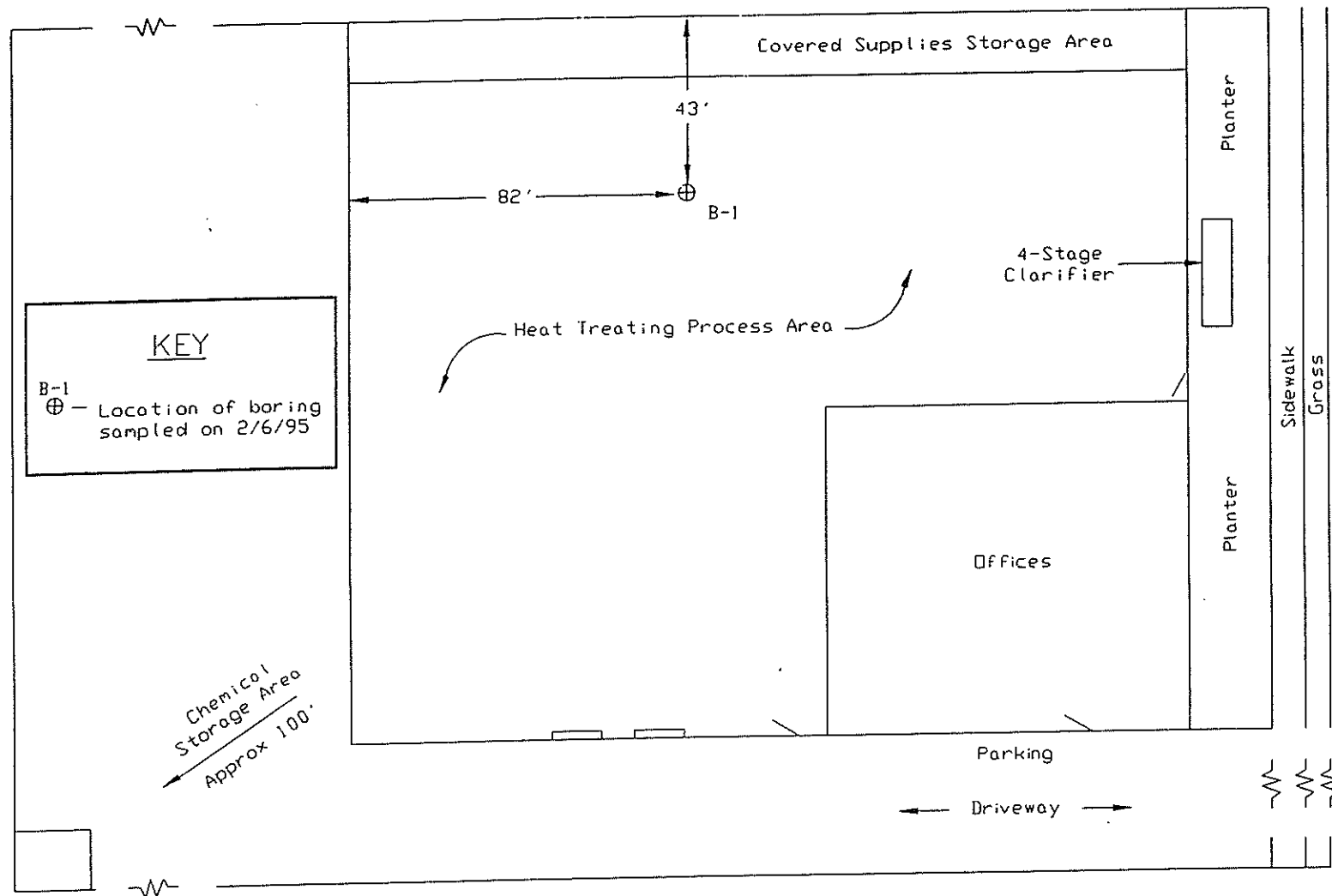
Based on the results of laboratory analyses presented above, elevated concentrations of PCE and TCE are indicated to be present in the soil beneath the site. Further site investigation is required to evaluate the lateral and vertical extent of the indicated organic compounds.

6.0 LIMITATIONS

The services described in this report have been performed by Green Environmental, Inc. (GEI) and licensed or certified subcontractors to GEI. Conditions reported pertain the specific locations where samples were collected by GEI. Conditions may vary at different locations. This report contains findings, conclusions and recommendations which are based on data generated by a State certified laboratory. GEI makes no claim to its accuracy or correctness. The services performed by GEI have been conducted in a manner consistent with the level of care ordinarily exercised by members of our profession currently practicing under similar conditions. No other warranty expressed or implied is made.

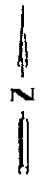
(report/condition)

FIGURES



KEY
 B-1
 ⊕ — Location of boring
 sampled on 2/6/95

0 40'
 SCALE
 1in=40ft

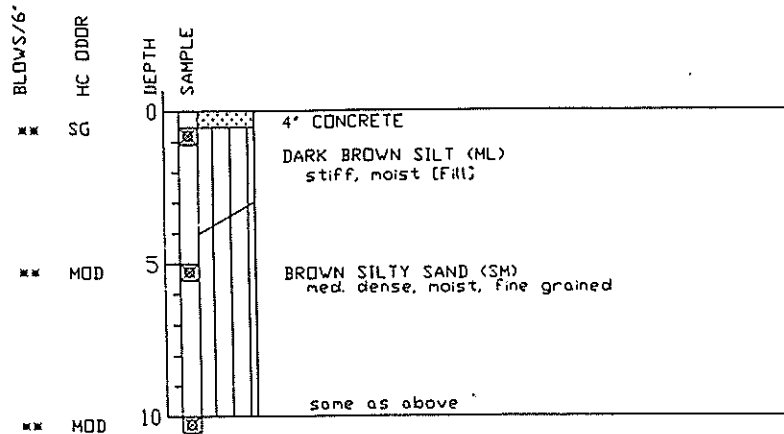


CONTINENTAL HEAT TREATING
 10643 S. Norwalk Blvd.
 Santa Fe Springs, CA

SITE PLAN/BORING LOCATION

Project No.: 1038-568	File: CONHT-2	FIGURE: 1
Date: 03/10/95	Drawn By: PWM	

Date: 2/6/95
 Equipment: 2.5' Diam. Hand Auger
 Elevation: Ground Surface



Boring terminated at 10.0 feet.
 No groundwater encountered during drilling.
 Boring backfilled with bentonite grout on 2/3/94
 [X] - Sample submitted for analysis.
 ** - No blow counts due to use of hand auger.

SHEET 1 of 1



CONTINENTAL
 HEAT TREATING
 10643 S. Norwalk Blvd
 Santa Fe Springs, CA

LOG OF BORING: B-1

Project No.: 1038-568

File: CHTB-1

FIGURE:

Date: 2/15/95

App By:

2

APPENDIX A

CHEMTEK
i n c.

ENVIRONMENTAL
LABORATORIES

14140 E. Alondra Boulevard
Suite A Santa Fe Springs
California 90670

Telephone 310-926-9848
Telefax 310-926-8324

CERTIFICATE OF ANALYSIS

Job No. 502016

Date: 02-08-95,

This is the Certificate of Analysis for the following samples:

Client:	Green Environmental, Inc.
Project No.:	1038-568
Date Received:	02-06-95
Number of Samples:	3
Sample Type:	Soil

Samples were labeled as follows:

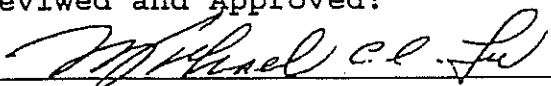
SAMPLE IDENTIFICATION

LABORATORY NUMBER

B-1-6"
B-1-5'
B-1-10'

502016-01A
502016-02A
502016-03A

Reviwed and Approved:



Michael C.C. Lu
Laboratory Director

CHEMTEK

i n c.

ENVIRONMENTAL LABORATORIES

14140 E. Alondra Boulevard
Suite A Santa Fe Springs
California 90670

Telephone 310-926-9848
Telefax 310-926-8324

Client: Green Environmental, Inc.
Project: 1038-568
Job No: 502016

Date: 02-08-95

Analysis: EPA 8240

Page 1 of 2

Sample Date: 02-06-95

Analysis Date: 02-06-95

COMPOUND	RESULTS IN $\mu\text{g/kg}$ B-1-6"	Detection Limit
Dichlorodifluoromethane	ND	1
Chloromethane	ND	1
Vinyl chloride	ND	1
Bromomethane	ND	1
Chloroethane	ND	1
Trichlorofluoromethane	ND	2
Acetone	ND	10
1,1-Dichloroethene	ND	1
Iodomethane	ND	1
Methylene chloride	ND	1
Carbon disulfide	ND	2
Acrolein	ND	10
Acrylonitrile	ND	10
trans-1,2-Dichloroethene	41	1
Vinyl acetate	ND	10
1,1-Dichloroethane	ND	1
2-Butanone	ND	10
Chloroform	ND	1
1,1,1-Trichloroethane	ND	1
Carbon tetrachloride	ND	1
1,2-Dichloroethane	ND	1
Benzene	ND	1
Trichloroethene	4759	1
1,2-Dichloropropane	ND	1
Bromodichloromethane	ND	1
2-Chloroethyl vinyl ether	ND	1
4-Methyl-2-pentanone	ND	10
cis-1,3-Dichloropropene	ND	1

COMMENTS: 'ND' - Not Detected (at the specified limit).

CHEMTEK

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ENVIRONMENTAL LABORATORIES

14140 E. Alondra Boulevard
Suite A Santa Fe Springs
California 90670

Telephone 310-926-9848
Telefax 310-926-8324

Client: Green Environmental, Inc.
Project: 1038-568
Job No: 502016

Date: 02-08-95

Analysis: EPA 8240

Page 2 of 2

Sample Date: 02-06-95

Analysis Date: 02-06-95

COMPOUND	RESULTS IN $\mu\text{g/kg}$	Detection
	B-6-1	Limit
Toluene	2	1
trans-1,3-Dichloropropene	ND	1
2-Hexanone	ND	10
1,1,2-Trichloroethane	ND	1
Tetrachloroethene	7514	1
Dibromochloromethane	ND	1
Chlorobenzene	ND	1
Ethylbenzene	ND	1
p+m-Xylene	2	2
o-Xylene	1	1
Styrene	ND	1
Bromoform	ND	1
1,1,2,2-Tetrachloroethane	ND	1
trans-1,4-Dichloro-2-butene	ND	1
1,3-Dichlorobenzene	ND	1
1,4-Dichlorobenzene	ND	1
1,2-Dichlorobenzene	ND	1

COMMENTS: 'ND' - Not Detected (at the specified limit).

System Monitoring Compounds	Surrogate %Recovery	QC Limit (%)
1,2-Dichloroethane-d4	103	70-121
Toluene-d8	94	81-117
4-Bromofluorobenzene	106	74-121

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ENVIRONMENTAL LABORATORIES

14140 E. Alondra Boulevard
Suite A Santa Fe Springs
California 90670

Telephone 310-926-9848
Telefax 310-926-8324

Client: Green Environmental, Inc.
Project: 1038-568
Job No: 502016

Date: 02-08-95

Analysis: EPA 8240

Page 1 of 2

Sample Date: 02-06-95

Analysis Date: 02-06-95

COMPOUND	RESULTS IN $\mu\text{g/kg}$ B-1-5'	Detection Limit
Dichlorodifluoromethane	ND	1
Chloromethane	ND	1
Vinyl chloride	ND	1
Bromomethane	ND	1
Chloroethane	ND	1
Trichlorofluoromethane	ND	2
Acetone	ND	10
1,1-Dichloroethene	ND	1
Iodomethane	ND	1
Methylene chloride	ND	1
Carbon disulfide	ND	2
Acrolein	ND	10
Acrylonitrile	ND	10
trans-1,2-Dichloroethene	2	1
Vinyl acetate	ND	10
1,1-Dichloroethane	ND	1
2-Butanone	ND	10
Chloroform	ND	1
1,1,1-Trichloroethane	ND	1
Carbon tetrachloride	ND	1
1,2-Dichloroethane	ND	1
Benzene	ND	1
Trichloroethene	21	1
1,2-Dichloropropane	ND	1
Bromodichloromethane	ND	1
2-Chloroethyl vinyl ether	ND	1
4-Methyl-2-pentanone	ND	10
cis-1,3-Dichloropropene	ND	1

COMMENTS: 'ND' - Not Detected (at the specified limit).

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ENVIRONMENTAL LABORATORIES

14140 E. Alondra Boulevard
Suite A Santa Fe Springs
California 90670

Telephone 310-926-9848
Telefax 310-926-8324

Client: Green Environmental, Inc.
Project: 1038-568
Job No: 502009

Date: 02-08-95

Analysis: EPA 8240

Page 2 of 2

Sample Date: 02-06-95

Analysis Date: 02-06-95

COMPOUND	RESULTS IN $\mu\text{g/kg}$	Detection
	B-6-1	Limit
Toluene	ND	1
trans-1,3-Dichloropropene	ND	1
2-Hexanone	ND	10
1,1,2-Trichloroethane	ND	1
Tetrachloroethene	290	1
Dibromochloromethane	ND	1
Chlorobenzene	ND	1
Ethylbenzene	ND	1
p+m-Xylene	ND	2
o-Xylene	ND	1
Styrene	ND	1
Bromoform	ND	1
1,1,2,2-Tetrachloroethane	ND	1
trans-1,4-Dichloro-2-butene	ND	1
1,3-Dichlorobenzene	ND	1
1,4-Dichlorobenzene	ND	1
1,2-Dichlorobenzene	ND	1

COMMENTS: 'ND' - Not Detected (at the specified limit).

System Monitoring Compounds	Surrogate %Recovery	QC Limit (%)
1,2-Dichloroethane-d4	105	70-121
Toluene-d8	109	81-117
4-Bromofluorobenzene	103	74-121

CHEMTEK

i n c.

14140 E. Alondra Boulevard
Suite A Santa Fe Springs
California 90670

ENVIRONMENTAL LABORATORIES

Telephone 310-926-9848
Telefax 310-926-8324

Client: Green Environmental, Inc.
Project: 1038-568
Job No: 502016

Date: 02-08-95

Analysis: EPA 8240

Page 1 of 2

Sample Date: 02-06-95

Analysis Date: 02-06-95

COMPOUND	RESULTS IN $\mu\text{g/kg}$	Detection
	B-1-10'	Limit
Dichlorodifluoromethane	ND	1
Chloromethane	ND	1
Vinyl chloride	ND	1
Bromomethane	ND	1
Chloroethane	ND	1
Trichlorofluoromethane	ND	2
Acetone	ND	10
1,1-Dichloroethene	ND	1
Iodomethane	ND	1
Methylene chloride	ND	1
Carbon disulfide	ND	2
Acrolein	ND	10
Acrylonitrile	ND	10
trans-1,2-Dichloroethene	ND	1
Vinyl acetate	ND	10
1,1-Dichloroethane	ND	1
2-Butanone	ND	10
Chloroform	ND	1
1,1,1-Trichloroethane	ND	1
Carbon tetrachloride	ND	1
1,2-Dichloroethane	ND	1
Benzene	ND	1
Trichloroethene	66	1
1,2-Dichloropropane	ND	1
Bromodichloromethane	ND	1
2-Chloroethyl vinyl ether	ND	1
4-Methyl-2-pentanone	ND	10
cis-1,3-Dichloropropene	ND	1

COMMENTS: 'ND' - Not Detected (at the specified limit).

CHEMTEK

i n c.

ENVIRONMENTAL LABORATORIES

14140 E. Alondra Boulevard
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California 90670

Telephone 310-926-9848
Telefax 310-926-8324

Client: Green Environmental, Inc.
Project: 1038-568
Job No: 502009

Date: 02-08-95

Analysis: EPA 8240

Page 2 of 2

Sample Date: 02-06-95

Analysis Date: 02-06-95

COMPOUND	RESULTS IN $\mu\text{g/kg}$ B-6-1	Detection Limit
Toluene	ND	1
trans-1,3-Dichloropropene	ND	1
2-Hexanone	ND	10
1,1,2-Trichloroethane	ND	1
Tetrachloroethene	1855	1
Dibromochloromethane	ND	1
Chlorobenzene	ND	1
Ethylbenzene	ND	1
p+m-Xylene	ND	2
o-Xylene	ND	1
Styrene	ND	1
Bromoform	ND	1
1,1,2,2-Tetrachloroethane	ND	1
trans-1,4-Dichloro-2-butene	ND	1
1,3-Dichlorobenzene	ND	1
1,4-Dichlorobenzene	ND	1
1,2-Dichlorobenzene	ND	1

COMMENTS: 'ND' - Not Detected (at the specified limit).

System Monitoring Compounds	Surrogate %Recovery	QC Limit (%)
1,2-Dichloroethane-d4	92	70-121
Toluene-d8	103	81-117
4-Bromofluorobenzene	98	74-121

CHEMTEK

i n c.

ENVIRONMENTAL LABORATORIES

14140 E. Alondra Boulevard
Suite A Santa Fe Springs
California 90670

Telephone 310-926-9848
Telefax 310-926-8324

EPA 8240 Matrix Spike Recovery

Job No.: 502016
Lab Sample ID: 502009-06A
Date Performed: 02-06-95

Compound	Sample conc	Spike Added	Spike Res	Dup Res	Spike %Rec	Dup %Rec	RPD	QC Limit RPD	QC Limit %Rec
1,1-Dichloroethene	0.0	10.0	9.8	10.2	98	102	4	14	71-136
Benzene	0.5	10.0	11.1	11.1	106	106	0	14	80-120
Trichloroethene	0.0	10.0	10.1	10.4	101	104	3	14	71-142
Toluene	1.7	10.0	12.6	12.4	109	107	2	15	80-118
Chlorobenzene	0.5	10.0	11.1	10.9	106	104	2	15	84-120

CHAIN OF CUSTODY RECORD

[illegible]

CHEMTEK ENVIRONMENTAL LABORATORIES INC.

14140 Alondra Boulevard, Suite A
Santa Fe Springs, Ca. 90670
Tel: (310) 926-9848 Fax: (310) 926-8324

Note:

Note:
Samples are discarded 30 days after results are reported unless other arrangements are made.
Hazardous samples will be returned to client or disposed of at client expense.

* Key: AQ-Aqueous NA-Nonaqueous SL-Sludge GW-Groundwater SO-Soil OT-Other PE-Petroleum

DISTRIBUTION: WHITE with report / YELLOW To CHEMTEK / PINK To courier

0117000

Mobil Exploration & Producing U.S. Inc.

10735 SOUTH SHOEMAKER AVENUE
SANTA FE SPRINGS, CALIFORNIA 90670

December 9, 1994

Mr. George Baker
Hazardous Materials Specialist
Health Hazardous Materials Section
Inspection Section
Los Angeles County Fire Department
7300 East Alondra Blvd
Paramount, CA 90723

SUBMITTAL OF TETRACHLOROETHYLENE
(PCE) INVESTIGATION REPORTS FOR
THE MOBIL JALK FEE PROPERTY
10607 NORWALK BOULEVARD
SANTA FE SPRINGS, CALIFORNIA

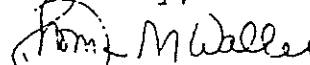
Dear Mr. Baker:

Enclosed are copies of the Levine Fricke and McLaren/Hart investigation reports for the tetrachloroethylene (PCE) contamination found at our Jalk Fee Property. I believe that these reports include the information you are looking for with regards to sampling protocol and lab results.

I would appreciate any information you could provide as to the status of the site investigation taking place on the Continental Heat Treating Inc. property. I would also like to receive a copy of the final report after the investigation has been completed.

Please let me know if you have any questions pertaining to the attached reports.

Sincerely,



T. M. Walker

Senior Environmental Engineer

1-76 " 203

Mobil Exploration & Producing U.S. Inc.

LA CO. is now
in volved with upgrading
PCE source via Indus
Wast. Remit. Calk with
Come here after SA- Also
PCE has a GSA

October 7, 1994

10735 SOUTH SHOEMAKER AVENUE
SANTA FE SPRINGS, CALIFORNIA 90670

Mr. Miguel Z. Monroy, Dr. Env.
Senior Hazardous Materials Specialist
California Environmental Protection Agency
Department of Health Services Control
Site Mitigation Branch, Region 3
1011 North Grandview Avenue
Glendale, CA 91201

CLARIFICATION OF AGENCY
OVERSIGHT - MOBIL JALK FEE
10607 NORWALK BOULEVARD
SANTA FE SPRINGS, CA

Dear Mr. Monroy:

This letter is intended to clarify agency oversight of Mobil's Jalk Fee property located at 10607 Norwalk Boulevard in Santa Fe Springs. We notified various agencies, including the Department of Toxic Substances Control (DTSC), the Los Angeles Regional Water Quality Control Board (LA RWQCB) and the City of Santa Fe Springs Fire Department of the presence of lead and perchloroethylene (PCE) in the soil at this property via correspondence date September 30, 1993. The DTSC recommended the submittal of a Preliminary Endangerment Assessment (PEA) covering this property by way of a letter dated October 27, 1993. Mobil responded with a letter dated November 15, 1993 stating that we would work with the DTSC on both the lead and PCE issues.

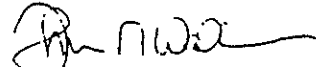
Subsequently, three ground water monitoring wells were positioned on the Jalk Fee property in preparation for construction of a crude oil bioremediation cell (located in the portion of the property not affected by lead and/or PCE contamination). Analysis of samples taken from one of these wells indicates the presence of PCE in the groundwater under this site. This information has been reported to the LA RWQCB through the quarterly monitoring report required by the LA RWQCB for operation of the crude oil bioremediation cell. Given that the groundwater beneath the site has been impacted, it is our understanding that the LA RWQCB will assume the lead agency oversight role regarding the PCE issue.

CLARIFICATION OF AGENCY OVERSIGHT
MOBIL JALK FEE
PAGE 2

We are still working with the DTSC with regards to the lead contamination, as evidenced by our "Letter of Intent" submitted to the DTSC on August 8, 1994. Mobil, through McLaren/Hart (our environmental contractor) will be contacting you in the near future regarding the status of our voluntary cleanup agreement pertaining to lead contamination.

If you have any questions concerning this property, please call me at (310) 903-2725.

Sincerely yours,

A handwritten signature in dark ink, appearing to read 'T. M. Walker', with a stylized flourish at the end.

T. M. Walker
Senior Environmental Engineer



DRAFT

SUBSURFACE SOIL INVESTIGATION

Jalk Fee Property
10607 Norwalk Boulevard
Santa Fe Springs, California

December 6, 1991
LF 2193

Prepared for:

Mobil Exporation & Producing U.S. Inc.
10,000 Ming Avenue
Bakersfield, California 93311

**PRIVILEGED & CONFIDENTIAL
ATTORNEY/CLIENT WORK PRODUCT**



LEVINE·FRICKE

December 6, 1991

LF 2193

EXECUTIVE SUMMARY

At the request of Mobil Exploration & Producing U.S. Inc. (Mobil), Levine•Fricke conducted a subsurface soil investigation at the Jalk Fee Property located on Norwalk Boulevard, approximately 1/4-mile north of Florence Avenue, in Santa Fe Springs, California ("the Site"). The objectives of the subsurface soil investigation were to assist Mobil in identifying, investigating, and evaluating areas at the Site which may have been affected by total petroleum hydrocarbons (TPHs) (e.g., crude oil) and/or chemicals previously used at the Site and, if affected soils were found, to provide data necessary for assessing the lateral and vertical extent of the areas affected by these compounds. The areas investigated at the Site included: (1) a former undocumented oil field refuse area (herein referred to as the "boneyard"); (2) the southern Site boundary; (3) the northern Site boundary; (4) eight former sump locations; (5) four active oil wells; (6) five inactive oil wells; (7) an existing aboveground storage tank farm; and (8) a former aboveground storage tank farm which was observed in historic aerial photographs on the southeastern portion of the Site.

Field activities were performed between November 1990 and September 1991. The activities included a shallow methane gas survey, the excavation of shallow test pits in the former boneyard area and eight former sump areas, and the drilling of 27 shallow soil borings to depths ranging from 20 feet to 55 feet below grade. Selection of test pit and soil boring locations were based primarily on information contained in a preliminary investigation report prepared by Woodward-Clyde Consultants (WCC) and the review of available historic aerial photographs of the Site.

Based on the results of this investigation, the following general areas of the Site were found to contain affected soils: (1) the former boneyard area; (2) the former aboveground storage tank farm; (3) former Sump 7; (4) former Sump 4; (5) the active oil wells; (6) the existing aboveground storage tank farm; (7) the northwest property boundary near an off-site equipment repair yard; (8) the northeast property boundary near an off-site equipment storage and maintenance yard; and (9) the southern portion of the Site near an off-site equipment storage and repair area. Selected perimeter

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portions of the Site were investigated because visual observations made during field activities indicated the presence of TPH-affected soils, possibly as a result of surface TPH spillage from off-site aboveground storage tanks.

Based on analysis of the methane gas survey data, GeoScience Analytical, Inc. (GAI) indicated that high concentrations of methane gas were detected in two areas on the Site: (1) near the abandoned aboveground storage tank farm and (2) near the active oil well Jalk 111 (i.e., on the eastern portion of the Site). GAI indicated that the methane was biogenic in origin, resulting from biodegradation of natural organic material and trace amounts of heavier biodegraded hydrocarbons in the soil. Shallow soils from the remainder of the Site were reportedly found to contain only background levels of methane. GAI indicated that methane gas mitigation was required for the eastern portion of the Site if construction is planned for that area.

Soil samples collected from the former boneyard area were analyzed for TPHs, volatile organic compounds (VOCs) (e.g., chlorinated solvents and benzene, toluene, xylene, and ethylbenzene [BTXE]) and Title 22 California Code of Regulations (Title 22 CCR) metals. Additional sampling and statistical analysis of the boneyard were also performed, and indicated lead concentrations slightly above regulatory levels. Soil samples collected near the active oil well areas were chemically analyzed only for TPHs and VOCs (Title 22 CCR metals were not considered to be a potential concern in these areas). Selected soil samples collected from the abandoned oil well areas were analyzed for TPHs, Title 22 CCR metals, and VOCs. Soil samples collected from the eight former sump locations were analyzed for TPHs, VOCs, Title 22 CCR metals, and semi-volatile organic compounds (SVOCs).

Of the 79 total soil samples analyzed for BTXE by either EPA Method 8260 or EPA Method 8020, only 14 samples had detectable concentrations of BTXE above the laboratory's test method detection limits. Thirteen of these fourteen samples had relatively low concentrations of BTXE. Test pit sample T9A-1a was found to contain benzene at 9.3 parts per million (ppm). Soil boring sample SB-27-15 was found to contain benzene at 2 ppm. In the remaining samples, benzene and toluene were detected at concentrations below 0.018 ppm, and xylene and ethylbenzene were detected at concentrations below 0.066 ppm. These concentrations are below typical BTXE cleanup concentrations described in the California State Water Resources Control Board's Leaking Underground Fuel Tank (LUFT) Field Manual. These LUFT manual cleanup concentrations are typically used by local regulators to recommend BTXE cleanup

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levels for soils affected with TPH concentrations equal to or greater than 1,000 ppm.

Based on laboratory chemical analysis of selected soil samples, six of the eight total former sump areas did not contain affected soils at levels typically requiring remediation by local and state guidelines. Two of the former sumps (Sumps 4 and 7) were found to contain elevated concentrations (greater than 1,000 ppm) of TPH- (i.e., crude oil) affected soils. The vertical and lateral extent of affected soils was assessed for each of these areas. Low concentrations of TPHs (below 1,000 ppm) were detected in soil samples collected from former Sumps 1, 2, 3, 5, and 8.

Elevated concentrations of lead and zinc were detected in soil samples collected from former Sump 8, and lead and copper were detected in soil samples collected from the former boneyard area. The Waste Extraction Test (WET) was used to further assess the soluble and extractable metal concentrations in those samples. Lead and zinc were detected in only one sample collected from former Sump 8 at concentrations below the respective STLC action limits for lead and zinc.

The WET analysis did not detect copper in soil samples collected within the boneyard area at concentrations above the Soluble Threshold Limit Concentration (STLC) value of 25 ppm, as listed in Title 22 of the California Code of Regulations, Section 66699(b). The WET analysis detected lead in a soil sample collected from the former boneyard area at concentrations above the STLC value of 5 ppm for lead. However, field investigations of the boneyard area revealed a very heterogenous lithology with no apparent localization of lead-affected soils.

Laboratory analyses of soil samples initially collected from the former boneyard area indicated somewhat elevated concentrations of several metals listed in Title 22 of the California Code of Regulations (CCR). Based on the number of soil samples previously collected from the former boneyard area, Levine•Fricke developed a sampling plan following procedures outlined in Test Methods for Evaluating Solid Waste (EPA Document SW 846), Chapter 9, for determination of whether these soils are considered hazardous waste based on Title 22 of the CCR. The methods presented in SW 846 outline a program of random sampling and analysis (i.e., a statistical analysis) of the solid waste and employing "scientifically credible statistical (techniques)" to the laboratory analytical data for determination of the hazard characteristics of the soil. SW 846 indicates that this method for evaluating solid wastes has "for all practical purposes, a 90% (confidence) interval."

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The modified statistical evaluation of the laboratory results for samples collected from the 3-foot and 8-foot sampling depths in the former boneyard indicated that only the 90% confidence interval concentration for lead in the lower sampling depth was above the STLC limit. All other analyte metals were below the respective STLC limits for both the 3-foot and 8-foot sampling depths. The elevated lead concentrations for the 8-foot sampling depth also increased the 90% confidence interval concentration in the combined statistical evaluation to above the STLC limit.

Based on the overall statistical evaluation of the soil sampling data from the former boneyard area, the lead concentration in the 90% confidence interval for the 8-foot sampling depth is the only analyte metal which exceeds the STLC limits. Therefore, isolated soils in the former boneyard area are considered hazardous due to the elevated lead concentrations.

Soil samples collected for VOC analysis revealed that the former aboveground storage tank farm was the only VOC-affected area on the Site. The former aboveground storage tank farm area was found to contain significant concentrations (greater than 100 ppm) of non-petroleum hydrocarbon constituents trichloroethylene (TCE) and tetrachloroethylene (PCE) and CIS-1,1-Dichloroethylene (DCE). TCE, PCE, and DCE were detected in soils near the former aboveground storage tank farm area at concentrations of 10 ppm, 2,500 ppm, and 53 ppm, respectively. Undifferentiated (C_8-C_{11}) as well as aliphatic and alicyclic hydrocarbons (C_6-C_{11}) were also detected in this area at concentrations of 300 ppm and 200 ppm, respectively. Chemical analysis of soil samples collected from soil borings SB-3 and SB-27 assessed the vertical extent of PCE-, TCE-, and DCE-affected soil from ground surface to approximately 20 feet below the ground surface. PCE, TCE, and DCE were not detected in soil samples collected from other areas of the Site.

It appears that TPH- (crude oil) affected soils (those with TPH concentrations greater than 1,000 ppm) are limited to three general areas on the Site. These areas include two former sump locations (former Sumps 4 and 7) and the former aboveground storage tank farm area. It has been our experience that the City of Santa Fe Springs requires cleanup of TPH-affected soils which exceed concentrations of 1,000 ppm. Based upon Site conditions, we believe it is likely that soils with TPH concentrations greater than 1,000 ppm will be required to be addressed or remediated prior to Site development. In addition, it appears that TCE-, PCE-, and DCE-affected soils detected near the former aboveground storage tank farm area will require remediation.

Three areas of the Site (the northwest property boundary, the northeast property boundary, and the southern property boundary) apparently are affected by TPH as a result of TPH spillage on off-site (neighboring) properties and the subsequent runoff from these properties onto the Site. Shallow soil sampling at selected locations around the perimeter of the Site indicated that these areas appear to contain only a relatively small quantity of affected soils.

Although this investigation did not assess shallow groundwater quality beneath the Site, soil analytical data indicate that compounds and materials (i.e., crude oil and volatile organic compounds) affecting surface and shallow soils at the Site attenuate with depth and do not appear to have migrated vertically to or near the water table. Based upon these conclusions, it appears that surface and shallow affected soils at the Site do not pose a significant threat to groundwater quality.

As part of this investigation, a Remedial Action Plan (RAP) was prepared to address each of the areas of environmental concern found on the Site. The RAP summarizes the soil treatment and/or disposal options for each area of affected soils on the Site. The RAP is presented under separate cover.

material and trace amounts of heavier biodegraded hydrocarbons in the soil. Shallow soils from the remainder of the Site were reportedly found to contain only "background levels of methane" (GAI, 1991).

GAI prepared an interpretative final report which included recommendations for methane gas mitigation. (See Appendix A.) Additional and more detailed information regarding methane gas mitigation is included in Levine•Fricke's Remedial Action Plan.

7.3 Soil Investigation Summary

The following summary of the investigated areas of the Site describes the areas where chemically affected soils were found to be present. For a graphic illustration of the approximate extent of the affected areas of the Site, please refer to Figure 7: Site Plan Showing Approximate Extent of Affected Spills.

Former Sumps 1, 2, and 6

Former sumps 1, 2, and 6 did not appear to be affected by TPH, VOCs, or Title 22 CCR metals. Soil samples were collected from soil borings and test pits in these areas. Analytical results for these samples did not indicate the presence of individual VOC concentrations above the laboratory's test method detection limits.

In addition, analytical results did not indicate detectable concentrations of SVOCs above the laboratory's test method detection limits in former sumps 1, 2, and 6. Metals were not detected above TTLC and STLC limits, and TPHs were not detected at concentrations greater than 1,000 ppm.

Former Sump 3

Affected soils were discovered only in one test pit located near an area associated with the Jalk 1 well and adjacent to the former aboveground storage tank farm. High concentrations of TPH and VOCs (i.e., TCE and PCE) were detected in samples from test pit T3B-10 and soil boring SB-3. However, soil boring SB-3 was drilled near the northern side of the former aboveground storage tank farm. High concentrations of TPH, TCE, and PCE were detected in the soil sample collected from SB-3 at a depth of 15 feet below grade. The sample collected from SB-3 at a depth of 25 feet below grade did not contain concentrations of TPH or VOCs above the laboratory detection limits. These detectable concentrations of TPH, TCE, PCE, and

DCE appear to lie within the boundaries of the former aboveground storage tank farm and therefore appear to be associated with this tank farm area rather than former Sump 3. Please refer to the former aboveground storage tank farm section of this report for a further assessment of affected soils in the former tank farm area.

Inactive Oil Wells Jalk 1, 2, and 114

Soils adjacent to inactive oil wells Jalk 1 and 2 do not appear to be affected by TPH, VOCs, SVOCs, or Title 22 CCR metals. Soils adjacent to abandoned oil well Jalk 114 do not appear to be affected by TPH or VOCs at concentrations typically requiring remediation by regulatory agencies. Of the VOCs detected in soil samples collected from soil borings and test pits adjacent to these wells, only toluene, xylene, and ethylbenzene were detected above the laboratory's test method detection limits. However, these compounds did not exceed typical regulatory or LUFT cleanup concentrations, as described in Section 7.3.

Former Boneyard Area: Test Pit and Initial Soil Boring Data

Historic aerial photographs and the WCC report identify and assess the approximate lateral extent of the former boneyard area. Interviews with Hathaway personnel revealed that scrap material and general oil field refuse were disposed in the boneyard (see Section 3.0).

Visual inspections conducted during test pit excavations in the former boneyard area indicated discontinuous areas of debris and unconsolidated fill material. In addition, visual inspection of soil samples collected from test pit excavations and soil borings drilled in the boneyard area indicated the presence of debris, refuse, and fill material. A total of 28 soil samples (including four QA/QC samples) were submitted to the analytical laboratory for Title 22 CCR metals analysis. Title 22 CCR metals analysis results of test pit soil boring samples indicated that only one analyzed sample (TLA-1) contained concentrations of lead and copper exceeding the STLC limits. Additional analysis using the WET method was performed on sample TLA-1 to assess the soluble and extractable concentration of lead and copper. Sample TLA-1 was found to contain soluble and extractable lead at a concentration of 18 ppm, which exceeds the STLC value of 5 ppm for lead. The WET analysis did not detect soluble and extractable concentrations of copper exceeding the STLC value of 25 ppm for copper.

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Analysis of soil samples collected from the two initial soil borings (SB-9 and SB-21) drilled in the former boneyard did not detect TPH above the laboratory's test method detection limit and did not detect any Title 22 CCR metals above the TTLC or ten times the STLC. In addition, of the VOCs analyzed, only methylene chloride was detected above the laboratory's test method detection limit at low concentrations of 0.048 ppm.

Former Boneyard Area: Statistical Analyses

Based on the results of the previous soil sampling and statistical analysis of the former boneyard area, isolated areas within the boneyard area with elevated total metals concentrations in excess of the TTLC limits and 10 times the STLC appear to be present. The individual total metals concentrations which exceeded the TTLC limits did not appear to increase the 90% confidence interval concentration from the statistical analyses to above the TTLC limits for any of the analyte metals. Several individual samples containing elevated concentrations of metals which exceeded 10 times the STLC limits did not adversely affect the 90% confidence interval for barium, cadmium, chromium, copper, mercury, or zinc.

The modified statistical evaluation of the laboratory results for samples collected from the 3-foot and 8-foot sampling depths in the former boneyard indicated that only the 90% confidence interval concentration for lead in the lower sampling depth was above the STLC limit. All other analyte metals were below the respective STLC limits for both the 3-foot and 8-foot sampling depths. The elevated lead concentrations for the 8-foot sampling depth also increased the 90% confidence interval concentration in the combined statistical evaluation to above the STLC limit.

Based on the overall statistical evaluation of the soil sampling data from the former boneyard area, the lead concentration in the 90% confidence interval for the 8-foot sampling depth is the only analyte metal which exceeds the STLC limits. Therefore, isolated soils in the former boneyard area are considered hazardous due to the elevated lead concentrations.

Based on aerial photographs and field data, the boneyard extends laterally approximately 125 feet in the north-south direction and approximately 155 feet in the east-west direction, and extends vertically to an approximate depth of 8 feet below grade. The estimated volume of soil in the boneyard area is approximately 5,735 cubic yards.

For purposes of this statistical analysis, Table 6 summarizes the initial Title 22 CCR metal analytical results which were used in the statistical analysis. Table 7 summarizes the soil sample results for the WET results for each specific metals. Selection of the specific samples for the WET analyses was based on the calculations performed as shown in Table 8. Table 8 summarizes the initial laboratory analytical results of Title 22 CCR total metals analysis of all the random samples which were selected for analysis, as indicated in Appendix F. Table 9 summarizes the modified statistical analyses results, including the WET metals concentration data. The details from which the statistical methodology was developed are outlined in Appendix F of this report.

Former Sump 8

Analysis of soil samples collected from SB-8 indicated the presence of zinc and lead at concentrations above the STLC limits within one of the three total soil samples analyzed for metals by Title 22 CCR metals analysis. Analysis of soil samples collected from SB-23, SB-24, and SB-25 indicated that lead and additional Title 22 CCR metal concentrations were below the TTLC and STLC limits for each metal. Since soil samples collected from the test pit and all but one soil sample collected from the soil borings did not contain zinc or lead concentrations exceeding the TTLC or STLC limits, the soils affected by zinc and lead appear to be relatively small, and it appears that the extent of affected soil is minimal. Only one sample collected from Sump 8 had detectable lead and zinc concentrations above the STLC.

Former Sump 7

Visual inspections conducted during the excavation of test pits in the area of former Sump 7 indicated the presence of a wood frame structure adjacent to abandoned well 3. Analytical results indicated elevated concentrations of crude oil in soil samples collected within and immediately beneath this wood frame structure. Approximately 60 percent of the fill material within the wood frame structure was removed during test pit excavation activities. This material was transferred to on-site storage bins. Lead was also detected in soil samples collected within and around the wood frame. However, soluble lead concentrations did not exceed the STLC limits. Based on field observations and soil analytical data, the lateral extent of crude oil-affected soils within former Sump 7 is approximately 10 feet in the north-south direction and approximately 10 feet in the east-west direction, and the vertical extent is approximately 6 feet below grade. The estimated volume of crude oil-affected soil in former Sump 7

is approximately 22 cubic yards. However, during test pit excavation activities approximately 8 cubic yards of the estimated total 22 cubic yards of soil were excavated and placed within an on-site soil container.

Former Sump 4

Visual inspections conducted during the excavation of test pits and chemical analyses (EPA Method 418.1) of soil samples collected from test pits excavated in the area of former Sump 4 indicated the presence of crude oil-affected soils near the ground surface. However, a review of gas chromatograms for soil sample T4B-1a collected from former Sump 4 indicated the possible presence of lighter hydrocarbons, possibly from crude oil. The lateral extent of crude oil-affected soils in this area was estimated to be approximately 300 square feet. Based on field observations and soil analytical results, the affected soils extend laterally approximately 10 feet in the north-south direction and 300 feet in the east-west direction and the vertical extent of affected soils is estimated to extend approximately 8 feet below grade. The estimated volume of affected soils in former Sump 4 is approximately 90 cubic yards.

Active Oil Wells

Currently there are four active oil wells on the Site. During field activities, Levine•Fricke visually observed heavy crude oil staining on surface soils around each of the well heads. Levine•Fricke is aware that this condition is common and unavoidable in an active oil field; however, prior to Site redevelopment, Mobil should remove the affected soils when these oil wells are appropriately abandoned. To preclude further saturation of soils with crude oil, Levine•Fricke recommends that the affected soils be removed and a concrete pad be installed around each of the well heads. Based on visual observation of each well head, it is estimated that the volume of affected soil for the four active wells is approximately 1,184 cubic yards. This estimate is based on an average of 10 feet by 10 feet (laterally) by 5 feet (vertically) of affected soil at each active oil well.

Existing Aboveground Storage Tank Farm

Several of the aboveground tanks in the existing aboveground storage tank farm are on a concrete pad with secondary containment structures. However, based on the review of historic aerial photographs, former aboveground storage tanks in this area were not protected by secondary containment structures. Past use of these tanks may have resulted in

uncontrolled leakage or spilling of crude oil onto shallow soils. The recently installed concrete pad prevents visual inspection of surface soils for indications of discoloration and the potential of crude oil-affected soils. If the aboveground storage tanks and secondary containment structures are removed during site redevelopment, shallow soils should be excavated, field screened, appropriately sampled, and chemically analyzed for the presence of crude oil (TPH) using EPA Methods 418.1 and 8015 (modified).

Chemical analysis results from soil samples collected at depths of 15 and 55 feet below grade from soil boring SB-20 (slant drilled to a total vertical depth of approximately 53 feet beneath the existing aboveground storage tank farm) did not indicate detectable concentrations of TPH or BTXE.

In the event that surface and relatively shallow soils are affected by TPH, Levine-Fricke estimated that the affected area would extend laterally approximately 100 feet in the north-south direction and approximately 110 feet in the east-west direction, and vertically to a depth of approximately 5 feet below grade. The estimated volume of affected soils in the existing aboveground storage tank farm is approximately 2,085 cubic yards.

Former Aboveground Storage Tank Farm

Based on chemical analyses of soil samples collected from test pits and soil borings within and adjacent to the former aboveground storage tank area, there appear to be PCE-, TCE-, DCE-, and crude oil-affected soils in this area. In addition, based on aerial photograph interpretation, field observations and soil analytical data, affected soils in this area extend laterally approximately 2 feet from the Site's southern fence line in the northern direction and approximately 50 feet from the eastern end of the concrete pad in the western direction. The estimated volume of affected soils is approximately 1,300 cubic yards. Analytical results of soil samples collected from SB-3 and SB-27 indicate that PCE-, TCE-, DCE-, and crude oil-affected soils do not extend vertically beyond 20 feet below grade. Analytical results from SS-13 indicate that PCE is present in shallow soils adjacent to the southern property boundary. Analytical results from T9A-1b and T9B-1 suggest that the eastern extent of affected soil does not extend beyond the eastern side of the existing concrete pad.

Based on the analytical results from SB-3, SB-27, T9A-1a, and SS-13, it appears that the southern extent of VOC-affected soil may extend beyond the southeastern Site boundary onto the adjacent property. The presence of TCE, PCE, and DCE in the

shallow soil does not appear to be associated with the former aboveground storage tank farm, which was apparently used for the storage of crude oil. It is not known whether TCE-, PCE-, and DCE-affected soil in the former aboveground storage tank area was the result of on- or off-site chemical handling.

Northwest Property Boundary

Visual observations made during an inspection of the northwest property boundary adjacent to an off-site equipment repair area indicated that surface drainage from the off-site equipment area flows onto the Site. Solvents and other spent chemicals used off-site for equipment maintenance may have drained onto the Site.

Based on visual inspections and soil analytical results, the affected soils extend laterally approximately 75 feet in the east-west direction along the Site's northwestern fence line and approximately 5 feet south from the northern fence line, and vertically to an approximate depth of 5 feet below grade. The estimated volume of affected soils in this area is approximately 69 cubic yards.

Northeast Property Boundary

Visual inspection of the northeast property boundary next to an off-site equipment storage and maintenance area indicated the potential for surface drainage from this area onto the Site. Solvents and other spent chemicals used off-site for equipment maintenance may have drained onto the Site.

Based on visual inspections and soil analytical data, affected soils extend laterally approximately 106 feet along the Site's northern fence line and approximately 10 feet south from the northern fence line onto the Site. The affected soils extend vertically to a depth of approximately 5 feet below grade. The estimated volume of affected soils in this area is approximately 200 cubic yards.

Southern Property Boundary

Visual inspection of the southern property boundary adjacent to an off-site equipment storage and repair yard indicated the potential for chemicals used and stored off-site to migrate onto the Site. Analytical data from hand-augered soil samples collected along the southeastern property line revealed an area of elevated TPH concentrations. Aboveground storage tanks located in this off-site area do not appear to have secondary containment structures, and the tank contents

(apparently petroleum hydrocarbons) have apparently leaked from the tanks and affected surface soils on the Site.

Based on visual observations and analytical data, affected soils extend laterally approximately 100 feet in an east-west direction along the southern fence line and approximately 10 feet north from the southern fence line onto the Site. We have estimated that the affected soils extend vertically to an approximate depth of 5 feet below grade. The estimated volume of affected soils in this area is approximately 48 cubic yards.

7.4 Shallow Ground Water

Although this investigation did not assess shallow ground-water quality beneath the Site, soil analytical data indicate that compounds and materials (i.e., crude oil and VOCs) affecting surface and shallow soils attenuate with depth and do not appear to have migrated vertically to or near the water table. In addition, field observations and soil analytical data indicate that soils affected by crude oil, PCE, TCE, lead, copper, and zinc lie approximately within the interval from the ground surface to 25 feet below ground surface. Based upon these conclusions, it appears that surface and shallow affected soils at the Site do not pose a significant threat to ground-water quality.

8.0 RECOMMENDATIONS

Based on the results of this investigation, there are five areas on the Site which require remedial action. These areas include: 1) the former boneyard; 2) Sump 7; 3) Sump 4; 4) the former aboveground storage tank farm; and 5) selected areas around the perimeter of the Site where off-site activities have resulted in on-site chemically affected soils. The spatial extent and type of compounds detected in each of these areas has been summarized in Levine•Fricke's Remedial Action Plan. Remedial recommendations for the Site are also discussed in Levine•Fricke's Remedial Action Plan.

Additional information regarding the soil remedial methodologies that Levine•Fricke proposes to implement at the Site, the rationale for selection of these methodologies, and further description of the costs, time frame, and technical feasibility associated with these methodologies is also included in Levine•Fricke's Remedial Action Plan.

Limited Subsurface Investigation

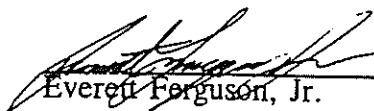
McLaren/Hart Project No. 03.0601382.000

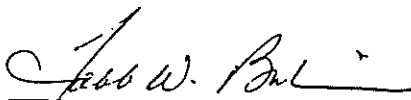
Tetrachloroethylene (PCE) Impacted Soil at Mobil Jalk Fee Property Santa Fe Springs, California

November 15, 1994

Prepared for: Mobil Exploration and Producing U.S. Inc.
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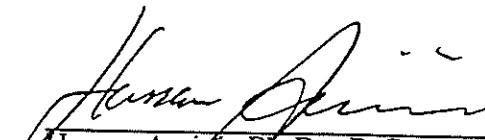

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APPENDICES

Appendix A	Soil Sample Collection Procedures
Appendix B	Chain-of-Custody Forms and Laboratory Analytical Data Sheets

1.0 INTRODUCTION

McLaren/Hart Environmental Engineering performed a limited environmental investigation at the Mobil Exploration and Producing U.S. Jalk Fee Property located at 10607 Norwalk Boulevard, Santa Fe Springs, California (Figure 1). The work was performed between July 25 and September 2, 1994, in accordance with the workplans entitled *Proposal for Treatment of Soil Containing Perchloroethylene (PCE) and Hydrocarbons at the Jalk Fee Lease, Santa Fe Springs, California (IR93-447)* dated January 19, 1994 and *Change Order Request for Additional Sampling of Soil Containing Tetrachloroethylene (PCE) at the Jalk Fee Lease, Santa Fe Springs, California (IR94-473)* dated August 30, 1994.

The investigation consisted of advancing 18 GeoProbes to obtain and analyze soil samples. The general objective of the environmental investigation was to characterize the distribution of halogenated volatile organic compounds (HVOCs) and petroleum hydrocarbons.

1.1 INVESTIGATION OBJECTIVES

The objectives of the environmental investigation were to:

- ▶ Characterize the vertical and lateral distribution of HVOCs, primarily PCE, in the soil.
- ▶ Characterize the vertical and lateral distribution of crude oil, represented by total recoverable petroleum hydrocarbons (TRPH), in the soil.

1.2 SITE HISTORY AND DESCRIPTION

During the early 1900's, oil was discovered near the subject site, and shortly after, the area became an active oil field. The subject site consists of 8.8 acres of undeveloped land located in the southwest portion of the oil field. Productivity of the oil field has declined in recent years,

but the field continues to have economic potential. In the past 20 years, some industrial and commercial development has occurred on the periphery of the oil field and has entirely surrounded the subject site.

Currently, the site contains five abandoned and four active oil wells, a small tank battery, and two temporary bioremediation cells. These cells are bioremediating TRPH affected soil from Mobil's Jalk Fee property, DeWenter/Jordan/Green, Baker/Humble, and Well 732-C sites. All work is being performed under the direction of the Regional Water Quality Control Board (RWQCB) - Los Angeles Region.

1.3 PREVIOUS WORK

Prior to McLaren/Hart, Levine-Fricke generated the following reports on the Jalk Fee property:

- ▶ *Draft Subsurface Soil Investigation Jalk Fee Property, 10607 Norwalk Boulevard, Santa Fe Springs, California* dated December 6, 1991
- ▶ *Draft Remedial Action Plan Jalk Fee Property, 10607 Norwalk Boulevard, Santa Fe Springs, California* dated December 18, 1991

McLaren/Hart's initial proposal was based upon data contained in these documents. According to Levine-Fricke (1991a), the Jalk Fee property has been used for oil production from the 1920s to the present. The current tenant, Hathaway Company, has conducted oil production activities at the site from the early 1980s to the present (Levine-Fricke, 1991b).

Most of the Jalk Fee property is undeveloped land with four active oil wells and a small tank battery. The tank battery is in the northwest corner of the site and contains six above ground tanks. Three of the active oil wells are near the northern property boundary and one well is near the southern boundary. According to Levine-Fricke (1991b), five oil wells have been abandoned on the property and approximately eight former sumps (i.e., mud pits) associated with oil drilling and production have been observed in historic aerial photographs.

According to Levine-Fricke (1991b), a small oil refuse area where metal objects were deposited (referred to as the boneyard area) was located in the southwest portion of the property from

approximately 1920 until 1942. An aboveground storage tank farm was formerly located in the southeast portion of the property in the late 1920s and early 1930s (Levine-Fricke, 1991b).

According to Levine-Fricke (1991b), Woodward-Clyde Consultants (WCC) completed a subsurface investigation at the Jalk Fee property in August, 1988. The investigation included a geophysical survey, surface soil sampling, and a soil boring and sampling program. The study was cancelled by a party other than Mobil prior to completion and only a "partial report" was prepared by WCC. The results were summarized in WCC's report dated September 14, 1988 entitled "Preliminary Investigation Report". WCC reportedly detected what were believed to be solvent odors and vapor discharge from borings in the eastern section of the Site.

According to Levine-Fricke (1991a), during discussions with Mobil it was reported "that the eastern portion of the site was leased at one time to a company that used solvents along that portion of the site." Recent investigations by Mr. Tom Walker, of Mobil, has revealed that the aforementioned leased property was located in the northeast portion of the property. The southern boundary of the leased property was approximately 70 feet north of the PCE impacted area (which is adjacent to the southern boundary of the Jalk Fee property). Additional samples should be collected and analyzed to support the non-detect result from one sample previously collected from this area (Levine-Fricke 1991a). Additionally, per Mr. Walker, the source of Levine-Fricke's information regarding the eastern portion of the site was not from a Mobil representative but rather originated from the current operator (Mr. "Doc" Hathaway) of the Jalk Fee oil wells.

Levine-Fricke (1991b) conducted subsurface investigations at the Jalk Fee property between November 1990 and September 1991. The field investigations included a shallow methane gas survey, the excavation of shallow trenches in the former boneyard and eight former sump areas, and 27 shallow soil borings to depths ranging from 20 to 55 feet below grade. The selection of the trench and soil boring locations were based on information presented in the partial report prepared by WCC, discussions with Mobil personnel familiar with the site, and review of historical aerial photographs. The results from the investigation were presented in Levine-Fricke's (1991a) December 6, 1991, report entitled "Draft Subsurface Soil Investigation, Jalk Fee Property" and briefly summarized in Levine-Fricke's (1991b) December 18, 1991 report entitled "Draft Remedial Action Plan, Jalk Fee Property".

The results from Levine-Fricke's (1991a) subsurface investigation indicated that only 10 of the 21 areas investigated had chemicals in soil. The southeast portion of the Jalk Fee property contained up to 2,500 ppm tetrachloroethylene (PCE) and other chlorinated compounds. Petroleum hydrocarbons up to 29,000 ppm were also detected in soil at this location. Based on the analytical results from soil samples collected from soil boring SB-3, Levine-Fricke (1991a) estimated that PCE-affected soil extends vertically from ground surface to approximately 20 feet below ground surface at this location (Levine-Fricke, 1991a). PCE was also detected in one surface sample obtained along the northern property boundary in the western portion of the site (near SB-17) at a concentration of 0.037 ppm.

Additionally, in a further attempt to identify possible sources of PCE and related compounds at the Jalk Fee site, McLaren/Hart reviewed the files of the southern neighboring property (Continental Heat Treating, Inc.) at the Environmental Compliance Section of the City of Santa Fe Springs. The results of this work are detailed in McLaren/Hart's September 23, 1993 letter entitled "Perchloroethylene (PCE) and Heavy Metals in Soil at the Jalk Lease". In summary, the file contained information indicating that the neighboring facility used PCE. An average volume of 125 gallons and a maximum volume of 250 gallons of PCE were stored per day at the Continental Heat Treating, Inc. facility (February 15, 1993 Hazardous Material Registration Forms).

1.4 HYDROGEOLOGIC SETTING

The Santa Fe Springs Oil Field is located on the Santa Fe Springs plain, which is part of the Montebello Forebay non-pressure area of the Central Basin. Groundwater is found throughout the region under unconfined conditions in the Recent Alluvium and in the underlying Exposition Aquifer. Numerous other aquifers are also present in the area, and are under confined to semi-confined conditions: the Gage, Hollydale, Jefferson, Lynwood, Silverado, and Sunnyside Aquifers. Within the Santa Fe Springs Oil Field, the upper 100 feet of sediments consist predominantly of permeable sands, although the upper 15 feet of sediments have a higher silt and clay content and lower permeability. According to geologic cross-sections presented in California Department of Water Resources (CDWR) Bulletin 104 (1988), the first regional groundwater-bearing zone is the Exposition Aquifer, which is first encountered at approximately 60 feet below grade. The second regional aquifer is the Gage Aquifer, first encountered at approximately 110 feet below ground surface, according to geologic cross-sections presented in CDWR (1988).

The depth to first groundwater in the area of the oil field has generally been reported at approximately 60 feet below grade, although localized perched zones have been encountered as shallow as 13 feet below grade. Information from the Los Angeles County Department of Public Works (LACDPW)-Hydrologic Records section indicates that the depth to water at well number 1625-N (located at the intersection of Telegraph Road and the Southern Pacific Railroad tracks approximately two-thirds of a mile northwest of the Jalk Fee property) was 58 feet below grade on April 30, 1992. The occurrences of groundwater at approximately 60 feet below grade correspond to the top of the saturated portion of the Exposition Aquifer. The regional, horizontal groundwater flow direction in both the Exposition and Gage Aquifers in the Santa Fe Springs Oil Field ranges from the south to southwest.

Although most of the aquifers in the area are separated by aquicludes, the Hollydale and Gage are hydraulically connected approximately 2,000 feet north of the intersection of Telegraph Road and Norwalk Boulevard. Approximately 7,200 feet north of the intersection of Telegraph Road and Norwalk Boulevard, the Hollydale, Jefferson, and Lynwood are also hydraulically connected. There are domestic and commercial water wells screened in the Lynwood and Silverado (250 to 780 feet below grade) throughout the city.

Significant hydrologic features in the area include the San Gabriel River, which flows approximately north-south along the western edge of the city. There are also two extensive water spreading grounds/percolation basins approximately 1 to 2.5 miles northwest of the city limits. These features will act as groundwater recharge, or "mounding" areas, thus inducing groundwater to flow away from them.

Soil at the site consists of interbedded sand, silty sand, sandy silt, silt, and clayey silt in the upper 30 feet. Sandy soils are loose to dense and silty soils are slightly stiff to hard. A very tight, dry, clayey silt is located approximately 15 to 20 feet below grade and exists throughout most of the investigated area. Perched groundwater was found at 5 to 10 feet below grade in small quantities near the concrete pad.

2.0 FIELD INVESTIGATION

McLaren/Hart's limited subsurface investigation consisted of advancing 18 GeoProbes to obtain and analyze soil samples for the presence for HVOC's and petroleum hydrocarbons. The following sections describe the approach and methods used to complete this investigation.

2.1 APPROACH

McLaren/Hart's comprehensive proposed scope of work included: (1) defining the vertical and lateral extent of PCE in the soil; (2) collecting groundwater samples to determine whether the PCE has migrated to groundwater; (3) preparing a Preliminary Endangerment Assessment/Feasibility Study/Remedial Action Plan; (4) excavating the PCE-containing soil, collecting confirmatory samples, and constructing a combined vapor extraction/aboveground bioremediation system; (5) treatment system monitoring for six months; and (6) preparing quarterly remediation status reports and a final closure report.

McLaren/Hart has completed soil sampling, at the Jalk Fee property, to further define the vertical and lateral extent of PCE in the soil.

2.2 PRE-INVESTIGATION ACTIVITIES

Prior to the soil investigation, several pre-investigation activities were conducted to insure the safety of field personnel and to complete field activities without costly delays. The pre-existing site Health and Safety Plan was updated in accordance with the Code of Federal Regulations (CFR) 1929.10. Review of Mobil underground utility drawings for the Jalk Fee property was conducted and Underground Service Alert (USA) was contacted for field utility verification. McLaren/Hart personnel conducted a utility clearance using a pipe locator and magnetometer to trace underground pipes. McLaren/Hart personnel completed pre-sampling organizational work including gathering field equipment and sampling supplies, instrument calibration, and project

manager scoping review. McLaren/Hart personnel also prepared subcontracts with the GeoProbe company.

2.3 GEOPROBE SAMPLING

Eighteen soil borings were drilled to a depth of at least 30 feet using a GeoProbe to obtain 87 soil samples (Figure 2). Six samples were collected from each location GP-1 thru GP-8 at 5-foot depth intervals from 5 to 30 feet. Four samples were collected from each location GP-9, 10, 11, 13, 14, 17, and 18 at 5, 15, 25, and 30 foot depths, from location GP-12 at 10, 20, 30, and 38 foot depths, and from location GP-15 at 10, 20, 30, and 48 foot depths. Three samples were collected from location GP-16 at 10, 20 and 30 foot depths (Figure 2).

Samples were analyzed for Halogenated Volatile Organic Compounds (HVOCs) using EPA Method 8010 and for Total Recoverable Petroleum Hydrocarbons (TRPH) using EPA Method 418.1. Sampling protocols are included in Appendix A.

3.0 ANALYTICAL RESULTS

A total of six compounds, including HVOCs and TRPH, were detected during the site investigations by Levine-Fricke and McLaren/Hart. Of the five detected halogenated volatile organic compounds (cis-1,2 Dichloroethene, trans-1,2 Dichloroethene, TCE, PCE, and Methylene Chloride), PCE was the most common; it also occurred at the highest concentrations. A summary of analytical results from Levine-Fricke's report is presented in Table 1 and Figure 2. Analytical results from McLaren/Hart's investigation is summarized in Table 2 and Figure 2. The six compounds detected during the site investigations are summarized below. Any analytical results reported in micrograms per kilograms or parts per billion (ppb) have been converted to milligrams per kilograms, or parts per million (ppm). Laboratory data sheets and chain-of-custody forms are included in Appendix B.

3.1 ANALYTICAL RESULTS SUMMARY

- ▶ TRPH was detected in concentrations ranging from 4 to 27,000 ppm.
- ▶ Methylene Chloride was detected in concentrations ranging from 0.007 to 3.6 ppm.
- ▶ Cis-1,2-DCE was detected in concentrations ranging from 0.012 to 2,100 ppm.
- ▶ Trans-1,2,-DCE was detected in concentrations ranging from 0.013 to 13 ppm.
- ▶ TCE was detected in concentrations ranging from 0.004 to 2,700 ppm.
- ▶ PCE was detected in concentrations ranging from 0.002 to 55,000 ppm.

4.0 SUMMARY AND CONCLUSIONS

For reference purposes, a concentration level of ten times the maximum contamination levels (MCLs) for drinking water are being used to identify the extent of HVOC impacted soils. These are not established clean-up level for the site. Appropriate clean-up levels must be negotiated with the applicable regulatory agency.

4.1 HVOC PLUME

HVOCs detected at 5, 10, 15, 20, 25, and 30 feet below grade which exceed ten times the MCLs are shown on figures 3 through 8, respectively. Figures 3 through 8 show detected concentrations at each location for the indicated depth, as well as, the lateral extent of the impacted soil. Locations with no concentrations listed were not sampled at that depth. Since not every GeoProbe location was sampled at each 5 foot interval, if the samples above and below a non-sampled interval were above ten times the MCL, the interval not sampled was assumed to be above ten times the MCL. As illustrated on the figures, the HVOC impacted soil occurs in two distinct areas; near the concrete pad and west of the concrete pad along the fence line.

Based on field observations and analytical results from the current soil investigation at the Jalk Fee property in Santa Fe Springs, California, the following conclusions have been reached:

- ▶ Since the impacted soil containing the highest HVOC concentrations are confined to depths shallower than 20 feet, the source of the contamination probably resulted from surface spillage.
- ▶ Since normal crude oil production does not involve the use of PCE, it appears that the PCE originated from a non-oil production source.

-
- ▶ Lateral extent of the impacted soil, above ten times the MCL, has been defined at 5, 10, 15, 20, 25, and 30 feet below ground surface.
 - ▶ Vertical extent of the impacted soil below 30 foot depth has not been defined; PCE was detected in GP-15 at 48 feet (0.31 ppm) and appears to have impacted groundwater in nearby monitoring well MMW-5 at 830 ppm (September 16, 1994).
 - ▶ The source of PCE in the soil along the southern property boundary does not appear to be related to the operations conducted by Mobil on the property. It is probable that the source of PCE is from an off-site source.

4.2 TRPH IMPACTED SOIL

Soils containing TRPH concentrations greater than 1,000 ppm were found at three locations north of the concrete pad and three locations south of the concrete pad (Figure 2). At two locations (T9A-1a and GP-9), elevated TRPH concentrations were detected at 4 and 5 feet below grade, respectively. At the remaining locations (GP-1, GP-7, GP-8, and SB-3), elevated TRPH concentrations were detected at 15 feet below grade (15 feet and 20 feet below grade in GP-1).

Based on field observations and analytical results from the current soil investigation at the Jalk Fee property in Santa Fe Springs, California, the following conclusions have been reached:

- ▶ Oil production activities on site has impacted the soils with TRPH compounds near the concrete pad.
- ▶ Vertical and lateral extent has been defined as two small surface areas and one small subsurface area at 15 feet below ground surface.

5.0 REFERENCES

California Code of Regulations, Title 22. 1992. Article 66699. Section on Environmental Health.

California Department of Water Resources. 1988. Planned Utilization of the Groundwater Basins of the Coastal Plain of Los Angeles County, Bulletin 104, Appendix A: Ground Water Geology, 181 pp.

Levine-Fricke. 1991a. Draft Subsurface Soil Investigation, Jalk Fee Property, 10607 Norwalk Boulevard, Santa Fe Springs, California. Unpublished report dated December 6, 1991.

Levine-Fricke. 1991b. Draft Remedial Action Plan, Jalk Fee Property, 10607 Norwalk Boulevard, Santa Fe Springs, California. Unpublished report dated December 18, 1991.

Table 1

Previous Soil Sample Analytical Results (Levine-Fricke, 1991a)
Mobil Exploration and Producing U.S., Jalk Fee Property

Volatile Organic Compounds (VOCs) and
Total Recoverable Petroleum Hydrocarbons (TRPH)

Page 1 of 1

Sample Location	Sample Depth (ft)	EPA Method 8260 (ppm)				EPA Method
		TCE	PCE	cis-1,2-DCE	Methylene Chloride	TRPH
T3A-2	Surface Grab Sample	NA	NA	NA	NA	NA
T3B-10	5	ND	ND	ND	ND	9900
T9A-1A	4	10	2500	7.9	3.6	3600
T9A-1B	4	ND	0.32	ND	0.009*	29
T9B-1	5	ND	ND	ND	0.007*	ND
SB-1	11	ND	ND	ND	ND	ND
SB-1	26	ND	ND	ND	ND	ND
SB-3	16	15	430	ND	ND	6100
SB-3	26	ND	ND	ND	ND	ND
SB-22	11	NA	NA	NA	NA	ND
SB-22	26	NA	NA	NA	NA	ND
SB-27	15	ND	ND	53	2*	NA
SB-27	30	ND	ND	0.02	0.03	NA
SS-13	4	ND	1.3	ND	ND	140

TCE = Trichloroethene

PCE = Tetrachloroethene

cis-1,2-DCE = cis-1,2-Dichloroethene

ND = None Detected

NA = Not Analyzed

* = also identified in laboratory blank samples

Source: Table 2 and Table 3, Levine-Fricke 1991a

Table 2

Soil Sample Analytical Results
Mobil Exploration and Producing, U.S., Jalk Fee Property

**Halogenated Volatile Organic Compounds (HVOCs) and
Total Recoverable Petroleum Hydrocarbon (TRPH)**

GeoProbe ID	Depth (ft)	EPA Method 8010 (ppm)				EPA Method 418.1 (ppm)
		cis-1,2-DCE	trans-1,2-DCE	TCE	PCE	TRPH
GP-5	5	0.022	BRL	BRL	BRL	BRL,
	10	0.014	BRL	BRL	BRL	BRL
	15	BRL	BRL	BRL	BRL	BRL
	20	BRL	BRL	BRL	BRL	BRL
	25	0.53	BRL	0.098	0.092	BRL
	30	0.015	BRL	BRL	BRL	BRL
GP-6	5	0.23	BRL	0.055	0.045	BRL
	10	0.021	BRL	BRL	BRL	BRL
	15	2100	13	2700	55000	750
	20	0.023	BRL	BRL	0.022	BRL
	25	0.12	BRL	0.03	0.026	BRL
	30	0.11	BRL	BRL	BRL	BRL
GP-7	5	BRL	BRL	0.059	7	74
	10	0.073	BRL	0.018	0.14	BRL
	15	BRL	BRL	BRL	0.049	8000
	20	BRL	BRL	BRL	BRL	BRL
	25	BRL	BRL	BRL	BRL	BRL
	30	1.3	0.014	0.23	0.68	BRL
GP-8	5	BRL	BRL	BRL	0.034	350
	10	0.06	BRL	BRL	0.17	120
	15	0.21	BRL	BRL	0.053	2800
	20	BRL	BRL	BRL	BRL	BRL
	25	0.38	BRL	0.024	0.22	BRL
	30	0.019	BRL	BRL	BRL	BRL

Table 2

Soil Sample Analytical Results
Mobil Exploration and Producing, U.S., Jalk Fee Property

Halogenated Volatile Organic Compounds (HVOCs) and
Total Recoverable Petroleum Hydrocarbon (TRPH)

GeoProbe ID	Depth (ft)	EPA Method 8010 (ppm)				EPA Method 418.1 (ppm)
		cis-1,2-DCE	trans-1,2-DCE	TCE	PCE	TRPH
GP-9	5	0.71	0.048	5.3	2.7	4000
	15	BRL	BRL	BRL	BRL	66
	25	BRL	BRL	BRL	BRL	BRL
	30	NA	0.039	0.014	0.026	4
GP-10	5	BRL	BRL	BRL	BRL	BRL
	15	0.014	BRL	0.042	3.5	680
	25	0.015	BRL	BRL	BRL	BRL
	30	NA	0.31	0.032	0.18	6
GP-11	5	BRL	BRL	BRL	1.9	57
	15	0.026	BRL	BRL	0.055	BRL
	25	0.47	BRL	0.019	0.8	BRL
	30	NA	0.014	BRL	0.002	5
GP-12	10	0.031	BRL	BRL	0.014	BRL
	20	BRL	BRL	BRL	0.016	BRL
	30	0.31	BRL	0.027	0.035	BRL
	38	NA	BRL	BRL	BRL	4
GP-13	5	BRL	BRL	BRL	0.19	BRL
	15	BRL	BRL	BRL	BRL	BRL
	25	0.45	BRL	0.021	1.7	BRL
	30	NA	0.21	0.026	0.78	5
GP-14	5	BRL	BRL	BRL	BRL	BRL
	15	BRL	BRL	BRL	BRL	BRL
	25	0.044	BRL	BRL	0.036	BRL
	30	NA	BRL	BRL	0.007	4

Table 2

Soil Sample Analytical Results
Mobil Exploration and Producing, U.S., Jalk Fee Property

**Halogenated Volatile Organic Compounds (HVOCs) and
Total Recoverable Petroleum Hydrocarbon (TRPH)**

GeoProbe ID	Depth (ft)	EPA Method 8010 (ppm)				EPA Method 418.1 (ppm)
		cis-1,2-DCE	trans-1,2-DCE	TCE	PCE	TRPH
GP-15	10	BRL	BRL	BRL	27000	520
	20	BRL	BRL	BRL	0.25	BRL
	30	BRL	BRL	BRL	0.43	BRL
	48	NA	BRL	BRL	0.31	4
GP-16	10	0.015	BRL	BRL	0.35	BRL
	20	BRL	BRL	BRL	0.021	BRL
	30	NA	0.049	0.004	0.29	6
GP-17	5	BRL	BRL	BRL	0.019	BRL
	15	BRL	BRL	BRL	0.21	BRL
	25	BRL	BRL	BRL	2.9	BRL
	30	NA	BRL	BRL	0.24	3
GP-18	5	BRL	BRL	BRL	BRL	BRL
	15	0.013	BRL	BRL	0.029	BRL
	25	0.54	BRL	0.027	1.3	BRL
	30	0.031	BRL	BRL	0.032	BRL
SEP-1	6	BRL	BRL	BRL	2600	NA
SEP-2	6	BRL	BRL	BRL	78	NA

cis-1,2-DCE = cis-1,2 Dichloroethene
trans-1,2-DCE = trans-1,2 Dichloroethene
TCE = Trichloroethene
PCE = Tetrachloroethene
BRL = Below Reporting Limit
NA = Not Analyzed

**SOIL REMEDIAL ACTION PLAN
FOR THE JALK FEE, BAKER/HUMBLE,
AND DEWENTER/JORDAN/GREEN PROPERTIES,
MOBIL-OPERATED SANTA FE SPRINGS
OIL FIELD
SANTA FE SPRINGS, CALIFORNIA**

December 21, 1993

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This remedial action plan was completed under the direction of a California Registered Geologist.

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SECTION 1.0

INTRODUCTION

1.1 OVERVIEW AND OBJECTIVES

This document provides a remedial action plan (RAP) for the design, construction, and operation of an aboveground soil bioremediation cell to treat soil containing total petroleum hydrocarbons (TPH) above 1,000 parts per million (ppm). The majority of this TPH affected soil is from three properties in the Mobil-Operated Santa Fe Springs Oil Field in Santa Fe Springs, California:

- ▶ The Jalk Fee property at 10607 Norwalk Boulevard (Jalk Fee);
- ▶ The Baker/Humble 1 lease at 10720 Forest Avenue (Baker/Humble); and
- ▶ A five acre portion of the DeWenter/Jordan/Green lease at the northwest corner of Telegraph Road and Norwalk Boulevard (DeWenter/Jordan/Green).

These three properties have been active oil producing areas since the 1920s. The Jalk Fee and DeWenter/Jordan/Green contain active oil wells, while Baker/Humble contains only abandoned oil wells. Soil on the three properties contains crude oil from historical oil production. Figure 1 shows the locations of the three properties.

The objective of this remedial action is to excavate and remediate soils from each of the properties that contain TPH above 1,000 ppm. A bioremediation cell will be constructed on the Jalk Fee and will treat soil from the three properties. Soil from other properties within the Mobil-Operated Santa Fe Springs Oil Field will also be treated in this cell, although early bioremediation efforts will be focussed on soil from the three properties.

This RAP provides a detailed description of the planned bioremediation program to reduce TPH levels in soil to below 1,000 ppm. The RAP also includes a storm water management strategy for the excavation and remediation and a groundwater monitoring program at the bioremediation cell. This RAP presents the following:

- ▶ A brief summary of previous investigations conducted at the three properties and a description of the ongoing soil investigation at DeWenter/Jordan/Green.
- ▶ The rationale for using aboveground biological treatment for TPH-affected soils.
- ▶ A description of the soil bioremediation program, including the design and construction, monitoring, operation and maintenance, and closure of the bioremediation cell on the Jalk Fee.

- ▶ A storm water prevention plan for the bioremediation cell at the Jalk Fee and for soil excavation at all three properties.
- ▶ A groundwater monitoring program for the Jalk Fee.

The Jalk Fee contains two areas where chemicals other than crude oil are present:

- ▶ The boneyard in the southwest portion of the property where soluble lead, zinc, and copper were detected above the Soluble Threshold Limit Concentration (STLC) in soil; and
- ▶ The area adjacent to Continental Heat Treating in the southeast portion of the property where tetrachlorethylene (PCE) and other chlorinated hydrocarbons, most likely resulting from an offsite source to the immediate south, have been detected in soil (Figure 2).

This remedial action plan addresses only the TPH-affected soil. A Preliminary Endangerment Assessment (PEA) and RAP for the boneyard and PCE-affected soils is being prepared and will be submitted to the Department of Toxic Substances Control (DTSC).

All figures are included in Appendix A.

1.2 RATIONALE FOR ABOVEGROUND BIOREMEDIATION

Biodegradation is the breakdown of organic compounds by naturally occurring soil microorganisms. Bioremediation is the stimulation of this natural breakdown by enhancing the soil environment to provide optimal conditions for biodegradation. The most important environmental condition for enhancing biodegradation is the availability of oxygen. Other conditions that affect biodegradation include nutrient levels, temperature, pH, salinity, presence of toxic compounds such as heavy metals, and the concentration of the compounds being degraded.

Aboveground bioremediation typically involves spreading TPH-affected soil evenly over a treatment area, maintaining proper moisture content, adding nutrients to promote biological activity, and tilling the soil periodically to aerate the soil. The increased oxygen provided by aeration and the increased availability of nutrients stimulates the biodegradation of organic contaminants by the native microorganisms which utilize the organic compounds (in this case, petroleum hydrocarbons) as a source of carbon and energy for growth. The petroleum hydrocarbons are transformed into harmless byproducts of microbial metabolism such as carbon dioxide, water, and microbial biomass.

Aboveground bioremediation was selected as the remedial alternative for the TPH-affected soil at the three properties for the following reasons:

- (1) Bioremediation is a proven, well-documented cleanup technology for TPH-affected soils.

- 2) Bioremediation can reduce the TPH concentration to below 1,000 ppm.
- (3) Bioremediation is more cost-effective than offsite disposal for large volumes of soil such as those anticipated for this project (i.e., greater than 10,000 cubic yards).

Aboveground bioremediation has been successfully used in similar oil production areas throughout Southern California to reduce petroleum hydrocarbon concentrations in soil. Aboveground bioremediation is expected to reduce TPH in soils excavated from each of the three properties to below 1,000 ppm within three to six months.

1.3 BACKGROUND

This section provides background information on each of the three properties.

1.3.1 Jalk Fee

The Jalk Fee occupies approximately 8.8 acres at 10607 Norwalk Boulevard (Figure 2). The property is bounded on the north, west, and south by industrial properties and to the east by Norwalk Boulevard. According to Levine-Fricke (1991b), the Jalk Fee has been used for oil production from the 1920s to the present. The current tenant, Hathaway Company, has conducted oil production activities at the site from the early 1980s to the present (Levine-Fricke, 1991c).

Most of the Jalk Fee is undeveloped land with four active oil wells and a small tank battery. The tank battery is in the northwest corner of the site and contains six above ground tanks. Three of the active oil wells are near the northern property boundary and one well is near the southern boundary. According to Levine-Fricke (1991c), five oil wells have been abandoned on the property and approximately eight former sumps (i.e., mud pits) associated with oil drilling and production have been observed in historic aerial photographs.

According to Levine-Fricke (1991c), a small oil refuse area where metal objects were deposited (referred to as the boneyard area) was located in the southwest portion of the property from approximately 1920 until 1942. An aboveground storage tank farm was formerly located in the southeast portion of the property in the late 1920s and early 1930s (Figure 2) (Levine-Fricke, 1991c).

1.3.2 Baker/Humble

The Baker/Humble lease occupies approximately 1.2 acres at 10720 Forest Avenue (Figure 3). The site consists of a roughly square western section and a rectangular eastern section extending to the former Ward Avenue. The site is bounded on the north by Border Freight, Inc., on the south by Pioneer Business Forms and Scientific Lighting Products, on the west by Forest Avenue, and on the east by Murray's Landscape.

The site is a former oil field that operated from the late 1920's to the late 1980's. McLaren/Hart's (1993a) review of historical aerial photographs and records from 1928 to 1992 indicated the presence of sumps, aboveground tanks, and dark spots or other features that could indicate potential sources of chemicals. The western section was Mobil's Baker/Humble 1 tank battery, which consisted of four aboveground storage tanks. These tanks contained crude oil pumped from nearby oil production wells. The tanks were present on the site from at least 1963, when they were first visible on the aerial photographs reviewed for this assessment. According to Mr. Roger Persson of Mobil, the tanks were removed in the fall of 1992 (McLaren/Hart, 1993a).

1.3.3 DeWenter/Jordan/Green

The DeWenter/Jordan/Green lease occupies approximately 5 acres at the northwest corner of Telegraph Road and Norwalk Boulevard (Figure 4). The property is bounded on the north by the Texaco, Inc., oil field, on the south by Bradshaw, Inc., and North American Plywood, on the west by Geary Avenue, and on the east by Norwalk Boulevard. The site is in a mixed commercial and light industrial area. One active oil well, one recently plugged and abandoned oil well, one aboveground tank farm, one abandoned aboveground tank farm, and three concrete sumps formerly for crude oil storage are on the property.

1.4 PREVIOUS SITE INVESTIGATIONS

Environmental site assessments and soil sampling investigations have been performed at the Jalk Fee and Baker/Humble. A Phase I environmental site assessment of DeWenter/Jordan/Green has been completed, although no soil sampling has been conducted. McLaren/Hart commenced a soil investigation at DeWenter/Jordan/Green on November 1, 1993. The scope of work for the ongoing investigation is presented in Subsection 1.5. The following two subsections describe the subsurface investigations at the Jalk Fee and Baker/Humble.

1.4.1 Jalk Fee

According to Levine-Fricke (1991b,c), Woodward-Clyde Consultants (WCC) completed a subsurface investigation at the Jalk Fee in August, 1988. The investigation included a geophysical survey, surface soil sampling, and a soil boring and sampling program. The study was cancelled by a party other than Mobil prior to completion and only a partial report was prepared by WCC. The results were summarized in WCC's report dated September 14, 1988 entitled "Preliminary Investigation Report". The results from the investigation by WCC confirmed the presence of a former boneyard in the southwest portion of the property measuring approximately 150 feet by 150 feet and the potential presence of chlorinated compounds in soils based on apparent solvent-like odors in the southeast section of the site. Chemical analyses of soil samples obtained by WCC detected mercury and lead in one composite sample from soil borings in the former boneyard (Levine-Fricke, 1991b,c).

Levine-Fricke (1991b) conducted subsurface investigations at the Jalk Fee between November 1990 and September 1991. The field investigations included a shallow methane gas survey, the excavation of shallow trenches in the former boneyard and eight former sump areas, and 27 shallow soil borings to depths ranging from 20 to 55 feet below grade. The selection of the trench and soil boring locations were based on information presented in the incomplete report prepared by WCC, discussions with Mobil personnel familiar with the site, and review of historical aerial photographs. The results from the investigation were presented in Levine-Fricke's (1991b) December 6, 1991, report entitled "Draft Subsurface Soil Investigation, Jalk Fee Property" and briefly summarized in Levine-Fricke's (1991c) December 18, 1991 report entitled "Draft Remedial Action Plan, Jalk Fee Property".

The results from Levine-Fricke's (1991b) subsurface investigation indicated that only 10 of the 21 areas investigated had chemicals in soil. These 10 areas were: (1) the former boneyard; (2) the former aboveground storage tank farm; (3) former Sump 7; (4) former Sump 4; (5) the active oil wells; (6) the existing aboveground storage tank farm; (7) former Sump 8; (8) the northwest property boundary near an off-site equipment repair yard; (9) the northeast property boundary near an off-site equipment storage and maintenance yard; and (10) the southern portion (southern property boundary) of the property near an off-site equipment storage and repair area. The locations of these areas are shown in Figure 2 (Levine-Fricke, 1991b,c).

Six of the eight former sump areas did not contain concentrations of TPH in soils at levels above the regulatory guideline for crude oil (1,000 ppm). Two of the former sumps (Sumps 4 and 7) were found to contain TPH concentrations greater than 1,000 ppm. The vertical and lateral extent of affected soils was assessed for each of these areas. The concentrations of TPH were below 1,000 ppm in soil samples collected from former Sumps 1, 2, 3, 5, and 8 (Levine-Fricke, 1991b,c).

Lead and zinc were detected in soil samples collected from former Sump 8 and lead and copper were detected in soil samples collected from the boneyard area. The Waste Extraction Test (WET) was used to further assess the soluble metal concentrations in those samples. The WET analysis did not detect copper in soil samples collected within the boneyard area at concentrations above the Soluble Threshold Limit Concentration (STLC) value of 25 ppm, as listed in Title 22 of the California Code of Regulations, Section 66261.24. The WET analysis detected lead in a few soil samples collected from the boneyard area at concentrations above the STLC value of 5 ppm for lead. Lead and zinc were detected in one sample collected from former Sump 8 at concentrations above their STLC values of 5 ppm and 25 ppm, respectively. Statistical analysis of the results of the field samples indicated that, although an occasional sample may exhibit results in excess of STLC limits, the mean concentration of all metals, except lead in the former boneyard area, was below STLC limits (Levine-Fricke, 1991b,c).

The area near Continental Heat Treating in the southeast portion of the Jalk Fee contained up to 2,500 ppm tetrachloroethylene (PCE) and other chlorinated compounds. Petroleum hydrocarbons up to 29,000 ppm were also detected in soil at this location. Based on the analytical results from soil samples collected from soil boring SB-3, Levine-Fricke (1991b)

estimated that PCE-affected soil extends vertically from ground surface to approximately 20 feet below ground surface at this location (Levine-Fricke (1991b,c). PCE was also detected in one surface sample obtained along the northern property boundary (near SB-17, Figure 2) at a concentration of 0.037 ppm.

Levine-Fricke (1991b) concluded that the lead-affected soils and the PCE-affected soils will require remediation.

1.4.2 Baker/Humble

A soil investigation was conducted by McLaren/Hart at Baker/Humble between June 24 and 28, 1993. The investigation consisted of completing eight trenches and obtaining soil samples in areas where historical aerial photographs and our site inspections showed evidence of sumps, aboveground tanks, dark spots, or other features that could indicate potential sources of chemicals. The results from the investigation were presented in McLaren/Hart's August 11, 1993, report entitled "Environmental Characterization at the Mobil Baker/Humble Lease, 10720 Forest Avenue, Santa Fe Springs, California".

The trenches were sampled at a frequency of approximately one sample location for every 20 feet of trench for a total of 18 sample locations (Figure 3). In the eight trenches, a total of 50 soil samples were collected from 18 total soil sample locations using an Extend-a-Hoe bucket. Soil samples were also obtained from six hand auger borings (Figure 3). These soil samples were to be used to document the presence or absence of metals in surface soils.

All soil samples from the soil trenches were analyzed for TPH by EPA Method 418.1. At each trench where field evidence of petroleum hydrocarbons in soil was present, the sample with the most field evidence of petroleum hydrocarbons was submitted for analysis of volatile organic compounds (VOCs) by EPA Method 8240, semi-volatile organic compounds (SVOCs) by EPA Method 8270, and California Assessment Manual (CAM) Title 22 metals by EPA Method 6010/7000 (17 metals). The sample below this was analyzed for benzene, toluene, xylenes, and ethylbenzene (BTXE) by EPA Method 8020. The surface samples obtained from the six hand auger borings were analyzed for CAM Title 22 metals by EPA Method 6010/7000.

Based on field observations and analytical results from the soil investigation at Baker/Humble, McLaren/Hart (1993b) reached the following conclusions:

- (1) Soil with TPH above 1,000 ppm was encountered only in the western portion of the site (Figure 3). The TPH above 1,000 ppm was found from approximately ground surface to 10 feet below grade in the area around the former aboveground tanks and from approximately 2 to 6 feet deep at the edges of this area. Localized areas around oil wells also exceeded 1,000 ppm TPH.